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THE NOSE AND THROAT IN THE HISTORY OF MEDICINE.

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(Continued from page 116.)

CELSUS AND THE PRÆ-GALENIC WRITERS.

In the eight books of the "De Medicina," which remain to us from the writings of Aulus Cornelius Celsus, who was probably born in the last days of the reign of Cæsar Augustus, about the beginning of the Christian era, are found several chapters which deal with the diseases of the upper air passages. Written by a Roman patrician, it is the first and almost the only work of medicine which has come down to us written in the Latin tongue as used by Virgil and Horace,* and all that brilliant coterie of men who adorned the imperial courts of Augustus and Tiberius, and sauntered through the gardens of Mæcenas. As an interpreter of Hippocrates he was profoundly influenced by the precepts of Asclepiades, but he evidently was a man of virile understanding

* The following lines have been held by some medical historian to refer to the physician Celsus, but there seems every reason to believe it was the somewhat earlier poet Celsus to whom Horace here, as several times elsewhere, alludes:

"Quid mihi Celsus agit? monitus multumque monendus
Privatus ut quærat opes, et tangere vitet
Scripta Palatinus quæcumque recepit Apollo,
Ne si forte suas repetitum venerit olim
Grex avium plumas moveat cornicula risum
Furtivis nudata coloribus."—(Horat. Epist. I, 3, 15).

We see by this extract that the library on the Palatine Hill, founded by Augustus was already in requisition by writers, and already the charge of plagiarism was much indulged in by the literati.

and original powers, whose works still contain much of value to the surgeon.

Coryza.

In his chapter on coryza (Lib. IV, Cap. V), he repeats the conviction of Hippocrates that some cases of phthisis owe their origin to catarrh of the upper air passages. "Destillat autem humor de capite interdum in nares, quod leve est; interdum in fauces, quod pejus est; interdum etiam in pulmonen quod pessimum est." For him, as for Hippocrates before him and Galen after him, the humor dripped through the cribiform plate. So far as the coryza is concerned, indeed, he says, there is nothing pestiferous about it unless it ulcerates the lungs. He recommended as treatment abstention from daily routine, and protection from the weather, as well as abstention from the bath, wine and venery. He approved of active exercise in the house and laid great stress upon massage. He advised against overeating and recommended that only a half pint of water a day be taken as drink. Warm vapors, the head and neck wrapped in flannel, and especial care to be given to the diet, were also urged. These prescriptions were varied somewhat as the discharges became thicker, but at all stages massage and exercise were to be employed.

Angina, Kynanche, Synanche.

In regard to throat inflammations (Liber IV, Cap. VII), those which are confined to the fauces, he said, the Romans called angina, while the Greeks gave the name synanche to that form in which there was dyspnea without any appearance of inflammation in the fauces, and cynanche to that form where the obstruction could be made out in the fauces. The Greeks supposed the former condition (i. e. the synanche) to be due to the disease of the "pneuma" itself, and that this it was which caused a collapse of all the parts of the chest and neck.*

With Celsus cupping, bleeding, purging were the remedies employed, the cups to be applied around the fauces. Hyssop, thyme, absinthe, bran or dried figs steeped in water were the highly agreeable gargles he used, though all his prescriptions were not so mild. Vinegar, powdered pepper and oxgall also formed part of his pharmacopeia. In certain cases he made deep incisions externally beneath the jaws and bled from the lingual veins. His incision into the palate above the uvula (VI–X) was

* There seems to have been great confusion among the Greek medical writers at this date in the use of the two terms. Galen in his "Commentaries on the Prognostics of Hippocrates" (Edit. Kühn XVIII, B. 267), intimates that the two terms arose out of a different reading of the initial letter in the word, as used by Hippocrates, by different writers, and that Hippocrates made no distinction. This is probably the correct explanation. We will find Aretæus making elaborate distinctions in the use of the terms.

more in accord with modern practice in quinzy. Without the necessary differentiation of diphtheria from quinzy or other inflammatory processes, we can readily understand his remark that "if the patient is not aided by these things, then we may know he is a victim to this disease." He apologizes for mentioning a remedy, which seems later to have been very popular in Rome for centuries, saying that it was somewhat out of place in a scientific work. Pliny and Galen mention the same and speak highly of its efficiency. A swallow either fresh or salted, having been kept thus in the house for the purpose, is to be burned to a cinder and the ashes, moistened in water, are to be applied to the throat in a threatened attack of angina. Pliny* dwells on the same remedy at considerable length, and dilates on the difference in the efficacy of the different kinds of swallows. On a reference to the Hindu Susruta (Vol. II, Cap. XXII) will be found the prototype of this prescription. "In affections (of the throat) arising from the blood and bile, cure is obtained by the use of swallows." This is one of the many instances of the Oriental origin of this sort of therapy. Celsus thinks no apology necessary when in the next chapter on dyspnea he recommends a paste made of dried fox liver powdered. He also advises it should be roasted and eaten. Even for dyspnea he recommends moderate exercise and does not forget massage.

Diphtheria.

"By far the most perilous of all ulcers (of the mouth) are those which the Greeks call Ἀφθαι, chiefly in children, for in men and women there is not the same peril." (VI–XI). Evidently this is diphtheria. He remarks that ulceration of the fauces is frequently followed by a cough, for which, of every description, he recommended long sea voyages, sea-side resorts and sea bathing. (IV–X). He devotes a chapter (IV–XI) to the spitting of blood and recognizes vicarious menstruation among other more frequent causes.

Ozena.

For ulcerated nares he recommended (VI–VIII) vapor of hot water from a narrow-necked vessel, and mineral astringents were applied to the ulcer. "But if these ulcers are around the openings and they have many crusts and a foul odor, which variety the Greeks call Ὀζαινα, it should be recognized that it is hardly possible to cure this disease. Nevertheless these things may be tried; let the head be shaved to the skin, and persistently and vigorously rubbed; let it be bathed with plenty of hot water; let there be much walking; moderate food, nothing very sharp or very

* Hist. Animal. XXX, 4, 12.

strong; then in the nostrils let honey be applied with a small amount of the resin of turpentine, which may be used on a probe wrapped with wool; let this liquid be drawn in with the breath until the taste of it is perceived in the mouth; by the use of this the crusts are loosened, which may then be removed by the use of sternutatories." How accurate this prognosis was we still have reason to know; how excellent the local treatment was we still bear testimony to in our present therapy of irritating applications to the nostrils. We recognize here another method of treatment which has been thought to be entirely modern. He advises leaving pledgets of lint saturated with some medication in the nostrils, this to be done twice a day in winter and spring and thrice a day in summer and autumn.*

In another place (VII–XI) he describes a very radical surgical operation for the cure of ozena, which has also been urged by at least one modern author.† Celsus does not, however, himself indorse the operation, which consisted in the use of the actual cautery through an earthenware tube or the quill of a writer's pen, and the affected parts thoroughly seared, and the wound dressed with astringent and soothing applications.

Polypi.

Nasal polypi, which he likened in appearance to the nipples of a female breast (VI–VIII), he treated by caustics. He described them as showing in front on the lip and sometimes behind, "by that foramen through which the breath descends to the fauces," hanging down so that it may be seen behind the uvula, and in cold, damp days it strangles a man. Some he calls *καρκινώδης*, and these should not be touched. Elsewhere he shows how the other kind may be cured by operation (VII–X). He used a sharp instrument like a spatula to separate it from the bone, and then by means of a hook it was to be removed. His surgical treatment for large and hard tonsils was to separate them from the sides of the throat with the finger (VII–XII) and tear them out, or drawing them inwards with a hook to cut them off. His operation for uvulotomy has not been improved upon. He cut the frenum linguæ for trouble in speaking, and this relieved many, but he had seen it fail once. He also was familiar with ranula. He mentions harelip, and elsewhere (VII–IX) describes operations for the cure of

* " * * linimentum involutum et oblongum eodem medicamento illinendum, demittendumque in narem, et ab inferiore parte leniter deligandum. Idque per hiemem et ver bis die; Per æstatem et autumnum ter die fieri debet." Bertherand, Médicine et Hygiène des Arabes, 1855; p. 502, notes the treatment of ozœna among Arabs, of Algeria by means of insertion in the nostrils of a seton of wool or a tuft of hair soaked in honey and some irritating substance. These, of course, are what we know as Gottstein's tampons.

† Rethi: *Arch. fur Laryngol. und Rhinol.*, Band ii, Heft 2.

that and other deformities about the face by plastic methods. He operated on bronchocele by making an incision through the skin and shelling the tumor out with the finger (VII–XIII). It may be easily seen from these few extracts that Celsus was well entitled to the name which has been given him—the Roman Hippocrates.

We have already had occasion to quote from Pliny knowledge which he said he had derived from the Magi. He died at the foot of Mount Vesuvius on that dreadful day (August 25, 72 A. D.) after a cloud shaped like a pine tree had the day before shot up in the air above the smoking mountain. It was seen by Pliny from his villa on the shore of the beautiful Bay of Naples at Misenum, and summoning the Roman galleys he commanded, he sailed into the mephitic vapors to rescue his terror-stricken friends, and perished in the attempt. Pompeii and Herculaneum lay buried beneath the hot ashes and cinders, and thus kept treasured up for eighteen hundred years the relics of the power and pride of Rome, who thought herself mistress of the world, to excite the wonder and curiosity of travelers from lands she had never dreamed of. He lay dead upon the shore, a brave man and a philosopher, and the work which he left behind him, the Historia Naturalis, became all through the Middle Ages the source from which credulous humanity derived its pharmacopia.

The Therapy of Pliny.

In the Dark Ages, among the half-civilized barbarians who flooded the Roman Empire and nearly extinguished the torch of civilization, the necromancy and the filthy drugs of Egypt and Chaldea found the ready market which Grecian culture and Roman civilization in the better ages never offered. The entrails and excreta of birds and reptiles and shell fish, all manner of fish, bird and beast, besides innumerable plants and minerals fill page after page of Pliny's treatise. Large numbers are recommended for nose and throat diseases, with very little discrimination as to the affections for which they were prescribed. In fact, one pursues the record of drug therapy through the history of medicine with very little profit. One may sum it all up by saying that human ingenuity has applied all medicaments to every disease.

Perhaps, after all, the best definition of a drug is that incidentally given by Montaigne in boasting of the health of his progenitors: "For them everything which was not in ordinary use took the place of drug." For an illustration of these remarks one may turn to Dioscorides, whose botanical and pharmacological work dates from about this time. Here we may find the swallow pre-

scription in many forms, not only for anginas, but for many other affections.

The Roman Empire, by the victories of Cæsar and Pompey, had undergone an immense expansion. All roads soon led to Rome. Asclepiades we have seen as the friend of Crassus and Cicero, but he came to Rome for fame and practice from his native Bithynia.

Aretæus. It is not certain that Aretæus lived in Rome, though it is probable he was acquainted with the practice of Italy. He was a native of Cappadocia. Even the exact date of the medical activities of Aretæus seems very uncertain, but it is supposed that he lived shortly before the birth of Galen (131 A.D.), in an era extending perhaps from the reign of Titus (79 A.D.) to that of the great Marcus Aurelius (161 A.D.). It is singular that so few contemporary and subsequent medical authors mention Aretæus, whose writings in perspicuity of observation and brilliancy of execution

The Uvula. are surpassed by none in the history of medicine. His chapter on diseases of the uvula is an interesting exposé of the different appearances presented by that organ in disease. The inflamed, reddened œdematous uvula; the elongated uvula, sometimes with what was apparently a papilloma at the end of it; the broad uvula, with bat-like wings at the side—for all these he had separate names—besides the bifid uvula, for which he had no name ("but which was recognizable by all"), while that is especially the form to which we moderns have given a name. He also described a condition left behind after an oblique amputation by the physician, a piece of membrane hanging down at the side. As to the symptoms we may use the translation of Adams:* "A sense of suffocation accompanies all these affections, and they can by no means swallow with freedom. There is cough in all the varieties, but especially in those named lorum (a broad, flat strap), and fimbria (the border or edge; this is the variety having a club-shaped end to it). For a titillation of the trachea is produced by the membrane, and in some cases it secretly instils some liquid into the windpipe, when they cough. It is safe to apply the knife in all these varieties; but in the *uva*, while still red, hemorrhage, pains and increase of inflammation supervene." In the chapter on the treatment of disease around the uvula, he states that many of them require surgical treatment, but these he does not discuss, his work on surgery having been lost. In this chapter it is evident that some severe faucial inflammation, accompanied by œdema of the

* Sydenham Edit. 1856. Of the Affections about the Uvula; Therapy of Acute Diseases. Book I, Chap. VIII.

uvula and by symptoms of dyspnea, many of the cases ending fatally, were familiar to Aretæus. We can only conjecture that some of these were diphtheria. His therapy was not especially different from that of Celsus in such cases, but at the end of this chapter on the therapy of the diseases of the uvula, occurs a sentence which to me is inexplicable on any other ground than that of the existence of syphilis, or again of some disease with which we are now not familiar, as I remarked in citing a similar passage from the Epidemics of Hippocrates. In this sentence of Aretæus the suggestiveness, to my mind, is still more striking. We may translate it thus: "But should the part become purulent, in some, the bones of the palate are destroyed, and having lingered a long time wasting away, they die." Now "consumption," as Adams translates it, does not produce necrosis of the palate except in very rare cases, and in these almost never beginning as a primary disease, but rather as a rare incident in the progress of general tuberculosis. Personally I have never seen a case of necrosis of the hard palate caused by anything but syphilis, though, of course, as before remarked, we must keep in mind the rare cases of scurvy and phosphorus poisoning.

Syphilis.

I have already had occasion to refer to the use of the two words kynanche and synanche, and have quoted Galen's remark that the difference apparently arose from the different readings of the initial letter of the word by the transcribers of the Hippocratic treatises. Cynanche (κυνάγχη) is a word applied to the choking of a dog, and Aretæus makes a part of his clinical picture of throat inflammation to consist of the tongue sticking out as a dog does, even in health. It must be borne in mind that Aretæus was supposed to be a disciple of the chief exponent of the Pneumatists, Archigenes, and hence we find him saying that he believed synanche to be a disease of the "pneuma" pure and simple, and he applies the term to those cases in which no obstruction is visible, or to those in which the inflammation has also descended to the thorax, but whether to one or to the other, they all have the common symptom of dyspnea, and he adduces the significance of the word, not as Galen suggests, but from the collapse of the parts about the neck and chest. Of course, it is evident here again that there is a misleading classification of throat inflammation, and if we take into account our present system, and we perceive the classification of Aretæus is really founded upon the situation of the lesion rather than its nature. That some of these cases were also diphtheria admits of no doubt, but in the category he also included peri-

Kynanche and Synanche.

tonsillitis and the graver forms of phlegmonous inflammation. As in Celsus, we find mention made of abscesses in these cases opening here and there around the ears externally, and it again becomes evident that they were familiar with more cases of severe and deep inflammation around the fauces than are we.

After admiring the many agreeable prescriptions recommended by Aretæus, we are shocked in the description of an elegant poultice scented with bay leaves, to find him gravely advising, as very efficacious in promoting suppuration, that the surface shall be sprinkled with the finely sifted dung of pigeons and dogs; but, on the whole, the treatment of the simple inflammatory conditions by local applications we recognize as most judicious. When it is apparently diphtheria, or other obstructive disease of the larynx, Aretæus and his confreres were helpless, and recognized the malady as deadly. He tried to bring the disease outward by sweats and counter irritation. In this place, the chapter on the Therapeutics of Synanche, occurs the much quoted passage in regard to laryngotomy, which I would translate thus: "But those who, as a precaution against suffocation arising from synanche, cut the trachea for the dyspnea, do not seem to me to have shown by the attempt that the operation is warranted, for the heat of the inflammation becomes greater from the wound, and besides increases the dyspnea and the cough; but if they escape from this danger, the lips of the wound do not heal, for they are both cartilaginous and unsuitable." [Here the fragment of this chapter abruptly ends.] Now, if we remember that Aretæus supposed that the dyspnea arose, not from obstructive causes as we understand them, but from a disease of the "pneuma" or breath itself,* we may understand how irrational a procedure the opening of the air tube seemed, and we well know that in the worst cases which were the ones usually reserved for tracheotomy, even up to the time of the advent of intubation in our own day, the results, on account of the extension of the trouble below the trachea, fully justified Aretæus' skepticism. We have seen that Asclepiades approved of the operation, and we shall find Paulus Aegineta, several centuries later, describing the operation and attributing it to Antyllus. While, as we have seen, there is abundant evidence that the other chapters on diseases of the throat include reference to cases which were diphtheria, there is a special chapter devoted

Laryngotomy.

Diphtheria.

* We may briefly define the pneuma as conceived by the ancients to be that part of the breath which contained the vital energy, but it would lead us too far astray to discuss all the various ramifications and forms and consequences of this idea, so necessary in some shape to any conception of the mystery we call life.

to a description "Of the Ulcers about the Tonsils," in which the disease is unmistakable. His description is very vivid, but as to the etiology he gropes in the dark, very much as men have done in all ages when seeking after the causes of phenomena. He says it occurs more frequently in children because they especially draw in deep and cold breaths; and there is more heat in them. They are greedy and hungry and their desires are capricious. They are petulant and do a great deal of bawling. It is common in girls until the beginning of the menses. It is especially common in Egypt and Syria on account of their diet and the dryness of the air. Hence they are called Egyptian or Syriac ulcers. We smile, but probably no more contemptuously than future historians will at our own ideas of etiology. They die he says from the foulness of the odors—from the ptomaines say we. In his symptomatology we miss only one characteristic, and that is the coughing up and the expectoration of the membrane, but this we find mentioned by Galen. His treatment included the use of escharotics and the cautery for the so-called ulcers. Various powders of an astringent nature were to be blown on them through a quill or a tube.* We hear little of massage and exercise from Aretæus; this therapeutical fad, like all fads, had had its day since the time of Asclepiades and of Celsus. We cannot part from Aretæus without quoting his description of the fatal termination of cases of these pestilential Syriac ulcers:

"The manner of death is most piteous; pain sharp and hot as from carbuncle; respiration bad, for their breath smells strongly of putrefaction, as they constantly inhale the same again into their chest; they are in so loathsome a state that they cannot endure the smell of themselves; countenance pale or livid; fever acute; thirst as if from fire, and yet they do not desire drink for fear of the pains it would occasion; for they become sick if it compress the tonsils, or if it return by the nostrils; and if they lie down they rise up again as not being able to endure the recumbent position; and, if they rise up, they are forced in their distress to lie down again; they mostly walk about erect, for in their inability to obtain relief they flee from rest, as if wishing to dispel one pain by another. Inspiration large, as desiring cold air for the purpose of refrigeration, but expiration small, for the ulceration, as if pro-

* Heymann credits Aretæus with being the first to make local applications to the larynx in this way, but it is found frequently mentioned in the Hindu writings. It is doubtful, however, if the powder ever got as far as the larynx. Without modern appliances and the laryngoscope, this is a difficult matter.

duced by burning, is inflamed by the heat of the respiration. Hoarseness, loss of speech supervene; and these symptoms hurry on from bad to worse, until suddenly falling to the ground they expire."*

Rufus of Ephesus.

As in the case of Aretæus, a similar uncertainly as to the time and locality in which Rufus Ephesius lived, is to be noted in history. He evidently was anterior to Galen, who speaks of him as one of the recent writers, while he does not refer to Aretæus at all, who must have flourished about the same time. It is said that Rufus Ephesius lived during the reign of Trajan, which began in 98 A. D. He wrote much on anatomical subjects and quoted extensively from the works of others. His own work, or rather such of it as has remained to us, is of little value. I have extracted from it the following notices which pertain to our subject. He speaks of the tonsils† as four in number, two on each side of the pharynx (σαρκώδη καὶ αδενοειδη) fleshy and gland like. We note thus early the occurrence of the word "adenoid" applied to the structure of this tissue. Again, in the "Anatomy of the Parts of the Body," ascribed to the same author, occurs the following: "At the deepest portion of the tongue and at each side of this organ are arranged at its base excrescences called lateral glands of the isthmus to the number of six; they have a gland like structure. The form is rounded. They are moveable and easy to excise; they are attached by means of small membranes which hold them at the base. Four are to be seen at each side of the bottom of the mouth—two are less visible." We may conjecture there has here been some mutilation of the text. He noted they are more prominent when inflamed. He recognizes that the uvula is of little use and its amputation produces no alteration of function. As we shall see, in the description of the tonsils he is less accurate than Galen, but more in accord with modern teaching as to the uvula. Rhazes, an Arabian writer, quotes Rufus as saying: "In fracture of the nose it is well to fill the nostril completely with cotton (or silk) stuff, and not extract it until the nose has taken its shape."‡

Adenoids

Tracheotomy of Antyllus.

Here is, perhaps, the place to introduce a quotation by Paulus Aegineta from the lost works of Antyllus, a surgeon of much note, who is said to have lived during the reign of Hadrian (117–138 A. D.). It is the first specific description of the technique of the operation of tracheotomy. I avail myself of the Sydenham

* I have here used the excellent translation of Adams.

† "Concerning the Names of the Parts of the Body;" Edit.: Daremberg, P. 64-65.

‡ Edit.: Daremberg, P. 471.

translation of Adams (Vol. II, P. 301). "The most famous surgeons have also described this operation (laryngotomy). Antyllus, therefore, says, "In cases of cynanche (as we will explain under the head of Dietetics) we entirely disapprove of this operation, because the incision is wholly unavailing when all the arteries (the whole of the trachea and bronchi) and the lungs are affected; but in inflammations about the mouth and palate and in cases of indurated tonsils, which obstruct the mouth of the windpipe, and the trachea is unaffected, it will be proper to have recourse to pharyngotomy in order to avoid the risk of suffocation. When, therefore, we engage in the operation we slit open a part of the arteria aspera (for it is dangerous to divide the whole) below the top of the windpipe, about the third or fourth ring. For this is a convenient situation, as being free of flesh, and because the vessels are placed at a distance from the part which is divided. Wherefore bending the patient's head backwards, so as to bring the windpipe better into view, we are to make a transverse incision between two of the rings, so that it may not be the cartilage which is divided, but the membrane connecting the cartilages. If one be more timid in operating, one may first stretch the skin with a hook and divide it, and then removing the vessels aside, if they come in the way, make the incision. These are the words of Antyllus." Now, by the phrase in parenthesis, "for it is dangerous to divide the whole," we are reminded of the passage I have cited from the Talmud. We may, therefore, entertain some conception of the antiquity of the operation of tracheotomy, though it is not mentioned in Pliny.

Cælius Aurelianus is another of the many medical writers whose epoch we can not definitely ascertain, though it is supposed he was a contemporary of Aretæus and of Galen. His barbarous Latin and his ignorance of Greek show that his knowledge of polite literature was limited, but his accurate description of disease, and especially his copious citations of earlier writers whose books have perished, make his works important in the history of medicine. He describes very vividly the symptoms of acute throat inflammation*, which he calls synanche, and he includes under this head everything of the kind. His treatment does not differ materially from that of Aretæus. He was very fond of the use of oil both as a menstruum for gargles and for the inunction of the whole body, when he used it warm in severe cases. He disapproved of the practice recommended by Hippocrates and his

Cælius Aurelianus.

* "De Acutis Morbis," Lib. III, Cap. I, II, III, IV.

followers, of bleeding from the veins beneath the tongue in synanche, saying it did harm rather than good. He notes Hippocrates suggestion of passing a tube along the tongue into the pharynx (or larynx?) for the relief of dyspnea. He strongly condemned the practice which he says Asclepiades falsely ascribed to the older writers of opening the trachea. He says the report is an invention of Asclepiades, that it is rash and dangerous, and it would be a crime to perform it.* Nevertheless, we have seen that Antyllus, who must have lived about the same time, carefully describing it, according to Paulus Aegineta. Aurelianus has a chapter on hoarseness† arising from colds and shouting, and notices the diseased uvula as the cause of chronic coughs; he has also a chapter on coryza.‡

GALEN.

Gibbon begins his immortal work, "The Decline and Fall of the Roman Empire," with the sentence: "In the second century of the Christian era the Empire of Rome comprehended the fairest part of the earth and the most civilized portion of mankind. * * * If a man were called to fix the period in the history of the world during which the condition of the human race was most happy and prosperous, he would, without hesitation, name that which elapsed from the death of Domitian (96 A.D.) to the accession of Commodus" (180 A.D.). It was in this epoch, at the culmination of the mightiest empire that the world has ever seen, that Claudius Galen lived. It was under Trajan (98-117 A.D.) the empire reached its greatest territorial extent§, and in the following reign of Hadrian (131 A.D.) Galen was born. With many vicissitudes of favor and exile he practiced at Rome and elsewhere. His early life was passed under the beneficent reign of Antoninus Pius, and that of the great Marcus Aurelius, whose friendship he is said to have enjoyed, but in his last days he must have witnessed the disgraceful scenes which marked the reign of the brutal and licentious gladiator Commodus, to whom he was physician in ordinary, and those of his impotent and infamous successors, when mighty Rome had already begun to totter towards the long delayed collapse of its wide spread power. Hence it is that after Galen we are to

* "De Morbis Acutis," III, IV.

† "De Morbis Chronicis," II, VI.

‡ "De Morbis Chronicis,' 'II, VII, VIII. For a more complete review of the work of Cœlius Aurelianus, especielly in regard to diphtheria and angina, *vid. Munch. Med. Woch.*, October 17. 1899, No. 42.

§ Freeman: "Chief Periods of European History."

meet no great work in medicine, which marks its material progress, for more than a thousand years. So intimately are all the forces of civilization interrelated and interdependent that the history of no one division can be intelligently followed without the sidelight which other parts throw upon it.

We see in Galen the culmination of the medical progress of the ancient world, and in the light he transmitted the new world, when it first began to emerge from the chaos of Rome's destruction, made its first feeble move towards a renewed growth in the development of medical knowledge.* I have several times had occasion to anticipate in this history the account of some of Galen's views, and it is not necessary here to review these. I have also had occasion to animadvert upon the great advance of the anatomical knowledge of the upper air passages displayed in the works of Galen, beyond that to be found in the works of his predecessors. It needs very little perusal of them to convince one of the enormous strides made in the anatomy of the human body since the days of Hippocrates, five or six hundred years earlier. From Celsus, one hundred years his senior, and from Aretæus, perhaps his contemporary, we can derive only slight information as to the anatomical and physiological knowledge they possessed. They were evidently men of commanding talent, but their works which have been preserved are too meagre for us to form much of an idea of their fundamental knowlege of the human body and its functions. It is in Galen's writings, therefore, that we first gain an idea of the advance made in those departments of medicine by the Alexandrian School of Anatomists. It is significant of the influence exerted by the great libraries of Pergamos and Alexandria that the birth and early education of Galen is accredited to the former city, and that he acquired at least some of his knowledge in the latter.† It would have been manifestly impossible for any one man to have himself originated the discovery of one-tenth part of the new anatomical facts we meet with in Galen for the first time, although he doubtless is the

The Anatomy of Galen.

* It is true that for seven hundred years his works were not read in Europe, but after Gregory destroyed the library on the Capitoline, that might be said of every other medical writer of merit. Under the Eastern Empire, during this time he was confessedly or secretly, with Pliny, the origin of all medical knowledge, but the first translations of Galen from Greek into Arabic, and hence into Latin, are in the eleventh and twelfth centuries, while direct translations from Greek to Latin did not take place until the fourteenth century.

† If, as it appears probable, Galen was not acquainted with the dissection of the human body, it would seem to follow that the practice of the Alexandrian School in the time of Erasistratus and Herophilus had not persisted to the time of Galen. This cessation, if it really took place, we may conjecture to have been due to the prevalence of indigenous Egyptian prejudice over the tendencies of Greek science.

real author of some of them, especially of those in regard to the larynx. Far inferior to the author of the best of the Hippocratic treatises in talent and in genius, but greatly surpassing him in accurate knowledge, Galen is contentious, prosaic and tiresome to the last degree. I would recommend that those who love to indulge in medical polemics should, as a punishment to fit the crime, be compelled to read seriatim the extant works of Claudius Galen. It is, however, to these very personal qualities we are indebted apparently not only for all the medical learning of his own times, but for very much which we possess of that which existed before his birth in the works of earlier writers. This it is which has raised the medical works of Galen above all others in importance to medical science, greater even than those of the school of Cos. Had the latter not come down to us in their own form, we would still have most of them reproduced either literally or in substance by Galen.

The Intermaxillary

Galen described an intermaxillary bone* in man. This apparent mistake was probably due to his observations on the skeletons of animals which he seems to have dissected much more frequently than man. It led many hundreds of years afterwards to a warm discussion between anatomists. Finally, in the last century, Vicq D'Azir and Goethe definitely settled the matter by showing that traces of this intermaxillary bone are found in the skulls of children and in the fetus. This was one of the forerunners of Darwinism, a discovery of one of the suggestive facts which, with Goethe's Metamorphosis of Plants, formed the germ of the doctrine of Evolution in the animal and vegetable world, and of the Spencerian philosophy. It is a striking instance of the necessity of a proper soil for the germination of any observation of nature. Had the old Greek and Roman civilization persisted a few centuries more, who can doubt but that the circulation of the blood‖ would have been known a thousand years earlier, or that the enlightenment which has followed the promulgation of the doctrine of Evolution would have been similarly antedated. Galen fully recognizes the nose as the beginning of the respiratory tract.† He describes the muscles‡ of the external nose as two in number, one on each side,

* "De Usu Partium," XI, Cap. XX.

‖ After a careful perusal of much of the writings of Galen I am unable to grasp thoroughly the idea he had of the circulation.

† "De Usu Partium," XI-II. I make use chiefly of Kühn's Edition.

‡ "De Dissectione Musculorum."

for the dilation of the nostrils, and he understood the distribution of the facial or hard part of the seventh pair of nerves to them.*

Nasal Anatomy.

Galen's description of the internal nose is the "Instrumentum Odoratus," reads as follows: "The nose having a median dividing wall has two conspicuous openings, one for each nostril, and each one of them is divided in the upper part into two portions. One of these divisions leads to the mouth and the other one upwards so that it starts from the entrance and ascends to the brain itself. There are two hollow oblong off-shoots of these (it?) towards it (these?)† having their beginning from the anterior cavities, reaching to that part of the skull where the nose has its origin. At this point is the situation of the sieve-like bones (ethmoid), the function of which the name indicates, and the thick membrane (the dura mater) with which that of the bones is continuous, is pierced by fine openings. Through these first the thicker parts of the excretions from the brain are transmitted (the custom was started by Aristotle of calling such things excretions), for things more vaporos mount to the sutures and escape from it. The thick part of these, such as phlegm in coryza, is carried downward, having first passed through the dura mater. After having been strained through the sieve-like bones, it thus passes into the channels of the nose. There is a part runs into the openings of those channels heretofore mentioned which lead into the mouth itself; and the mucus, especially such as is viscid, part of it falling at one end into the channels leading into the mouth, the other part into the passages on both sides which lead outwardly, is blown forcibly from the nostrils and is hawked out through the mouth. A bloodless (sic) membrane, thicker than the skin, lines those straight passages of the nose leading up to the sieve-like bones, and likewise those other oblique channels which I have said end in the mouth. This membrane is continuous with that lining the circumference of the whole mouth, and covering the tongue, and in addition to these the pharynx, the larynx, the trachea and the esophagus. To this membrane, which is one from the beginning and continuous, and in all the parts mentioned has the appearance of the same substance, but has not the same thickness in all parts, certain small nerves are distributed, springing from the

* "De Usu Partium," Lib. XVI, 3.

† Kühn's Greek text, from which I translate, does not seem to me to warrant the Latin construction which accompanies it. Neither the text nor the translation of Kühn are here felicitous. We must imagine that the text itself has been mutilated by ignorant and careless copyists, but Kuhn's translation in making use of an unwarranted construction does not thereby elucidate the anatomical description.

brain, except those to the tongue." This idea of the brain as the origin of the secretions of the mucous membranes of the respiratory and digestive tracts, as has been said, was due to the ignorance of the existence of the muciparous glands and to the absolute mental necessity of finding some explanation for the presence of the mucus. As we have seen, the idea is found in the Hippocratic writings and it persisted for two thousand years in medical belief. The eyes and ears were also supposed to void their secretions through the lachrymal sac and the Eustachian tubes into the nose. He describes the trigeminus nerve* as sending filaments to the mucous membrane of the nose and palate. In order to show how closely, in spite of the gross errors as to the internal anatomy of the nose, Galen's physiology corresponded with what is orthodox doctrine in laryngology to-day, I quote from another work of Galen.† Although the first sentence or two has now become obsolete, the rest seems as though it might have been taken from a modern text-book of the nose and throat: "It has been said concerning the uvula, in the commentary concerning the voice, that it contributes to the strength and beauty of the latter, and both in an admirable manner, since the entering air first is divided by it and the force of its current is broken, and thereby that of its frigidity, so that some of those who amputate it at its base not only clearly injure the voice, but the increased coldness of the inspiration is felt, and many breathing this into the lungs and the thorax are thereby killed, so that it it is not right to cut it off rashly, nor as chance would have it, but to leave some part of it at the base." "It has been stated before in regard to the perforations within the nostrils, how wonderfully the bone situated in front of the ventricles of the brain receives them, being similar to a sponge, and in regard to the passage of these into the mouth which is in the palate, how it is arranged that the beginning of the inspiration is not directly into the trachea, but there is a certain deflection of it, as a curve, before the breath arrives in the trachea, which arrangement it seems to me has a two-fold advantage; first, because the air surrounding us is at times quite cold and the lungs then would be chilled; and, secondly, because small particles of dust or of ashes or anything of this kind may not fall into the trachea. In this bend, indeed, the breath may be carried further, but small particles of this kind are arrested so that they first, at this turn, fall upon soft and wet surfaces which are somewhat mucilaginous and

The Functions of the Nose.

* "De Usu Partium," IX, 15.

† "De Usu Partium," XI, 11.

are thus able to retain those which fall. If any get as far as the mouth, they stick to the palate and uvula. An exemplification of this is what daily happens to those who wrestle in much dust, as well as to those who are on a dusty journey. In a little while they blow dust from their nostrils or spit it out; but unless the channels of the nostrils were first directed straight up in the head, and thence obliquely backward to the palate, and unless the uvula were there, it is evident that nothing would prevent everything falling into the trachea, for this sometimes happens when one breathes by the mouth. I have even seen many athletes beaten in this very way, because the dust being breathed in by the mouth, they are nearly suffocated. When, indeed, any inflammation or tumor is present or any other affection obstructing the nose, then they are compelled to breathe through the mouth; from which thing it is possible to know that the nose is first in order as an organ of respiration, while the mouth, if nothing affects the animal, is in no way the organ of respiration, but in certain cases mentioned is an aid to respiration, which all directly points to the fact, which I have urged at the beginning of every disquisition, that our Maker formed all these things with one end of His work in view."

The Voice.

Galen's book upon "The Formation of the Voice" has been lost. Doubtless, had this been preserved, we would have been able to find much of interest in it. As it is, we read much concerning the external muscles of the neck,* and we learn that he distinguished twelve intralaryngeal muscles, *i. e.*, six pairs.† He described the cartilages of the larynx as three in number, the thyroid, the cricoid and the arytenoid. He supposed the latter was a single cartilage. We have seen how Aristotle described the anatomy of the trachea. For him it was made up of entire cartilaginous rings superimposed one on the other; but Galen knew better, describing the membranous portion behind and recognizing its function‡ of facilitating deglutition.§

He is somewhat confused in his description of the production of the voice, at least in the books which have remained to us; but it seems as near as possible to the proper explanation in an age when the vibratory movements of the air as well as its other physical properties were so imperfectly understood. He claims to have been the first to discover and describe the ventricles of the larynx, and

* "De Usu Partium," VII, Cap. 17, et seq.

† "De Dissectione Musculorum."

‡ "De Usu Partium," XII. 3.

§ "De Dissectione Musc."

he well understood that the glottis was the point at which the voice was produced, likening it to an ancient flute. He describes the vocal cords as a membranous substance so constituted to resist the impact of the air and lubricated by mucus to prevent injury from the vibrations of a dry surface.* "For it is pointed out there ("The Formation of the Voice") both that the trachea prepares and prearranges the voice for the larynx, and it being arrived there, they (the cartilages) increase it, and it is still further augmented by the vault of the throat which acts like a sounding board, the palate like a plectrum." (l. c. VII, 5).

He reproves those who think the voice is sent forth by the heart, but declares that the larynx is the instrument of the voice.† He corrects Erasistratus‡ for saying that the pulmonary vein, like the bronchi, is free of blood; the latter, he says, contains blood only when there is a tear, or an anastomosis with a blood vessel, when it mounts to the pharynx and is voided.

We have seen that Galen, in a very qualified manner, was inclined to share the belief of his predecessors that fluids when swallowed passed at least to some extent into the lungs, and he seems to have believed that it is possible, by allowing medicaments to slowly melt in the mouth and by restraining the inclination to cough, for some of the material to finds its way into the larynx and thus benefit those suffering from affections of that organ, which he often noted in actors, singers, etc.‖ The drugs he commended for these troches are much the same as we use to-day. This was a favorite method of medication with Asclepiades. Perhaps it was for this reason that Galen declared that ulcers of the windpipe are easily cured. His explanation of speech was couched in almost the same words as that of Aristotle, saying that the voice produces vowels and the tongue, nares, lips and teeth form the consonants.§

The Glands.

He seems to have appreciated the identity of the lymph glands in the neck with those of other localities, for he says: "There are around the pharynx and larynx certain glands similar to those in the mesentery, but these latter are small, and on this account are not commonly recognized, but those around the fauces and larynx are large and prominent."¶ This, of course, could only have been

*"De Usu Partium," VII, 13.

†"Placitis Platon. et Hippocratii." II, 5.

‡"Usu Partium," VII, 3.

‖"De Compositione Medicament."

§"De Locis Affectis," IV, 9.

¶"De Aliment Facultat," III, 6.

learned by careful dissection, and from the context we may imagine that he confused pathological with physiological conditions.

Galen* quotes Marinus as saying: "The use of all the glands is two-fold; (1) for they either support the deep vessels which are accustomed to be suddenly swelled (?) and undergo the dangers of divulsion on account of more rapid movements; (2) or they are able to moisten by the generation of humors the parts which are in need of viscid and wide-spread lubrication, lest easily becoming dry they may be unfit for motion. (And as for the other kind of glands which reinforce the vessels whose function it is to open (?) we will leave that for the time, as we have no use for it in this place.)"

Elsewhere Galen† explains "that since the glands, which fill what space there is in the midst of vessels distributed to various parts, act as a foundation or support for this distribution, they are of no very great use to living beings, but nature out of its abounding provision has formed these glands as it has many other things."

Galen‡ reference to glands around the larynx and pharynx similar to those of the mesentery, may mean the thyroid and the tonsils. He refers in the same manner here to glands as elsewhere. This, quoted by Morgani§, I am able to find in Kühn's Galen. "Galen, or whoever is the author of the book, 'De Voce and Anhelitu," says: "The neck, however, has two glands in which humidity is generated. But from these two glands which are in the neck veins are not given off in which the humor runs as in those which come from the glands of the tongue." Evidently the thyroid gland.

He vaunts his discoveries in the larynx thus: "Attend, therefore, especially to this exposition which I have in hand, because I was the first to discover it. None of the anatomists have hitherto known anything of these nerves (the recurrents), nor of those things hitherto mentioned concerning the structure of the larynx. Therefore, having turned your attention to that which is most to be respected, and having become a pupil worthy of the instruction about to be imparted, listen to the exposition setting forth a most wonderful phenomenon of nature."‖ This wonderful arrangement

The Recurrent Nerves.

* "De Semine." Lib. II.

† "De Method Medendi," XIV, Cap. XI.

‡ "De Alimentorum Faculatibus," Lib. III, Cap. VI.

§ Morgani: "Adversaria Anatom," I, 26.

‖ "De Usu Partium," VII, 14. For a discussion of this subject, with an interesting account of a modern theory, see *The Lancet*, January 21, 1893.

was the reflection of the recurrent laryngeal nerves around the vessels of the thorax; but when he proceeds to explain it on the principle of the pulley, so that they may approch the laryngeal muscles from below, his solemnity and impressiveness in preparing the wondering pupils for the great secret seems a trifle ludicrous to modern readers. However, no one has really ever succeeded any better in attempting to explain this anatomical phenomenon, though there have been many theories advanced since the days of Galen.

Elsewhere* he again claims that he was the first to discover and give a name to the recurrent nerves, those only being known to his preceptors which were near the arteries (pneumogastrics). In several places he makes the statement that chilling of the recurrent nerves during operations damages the voice, and he, therefore, advised against operations in this region during cold weather. He relates the case of a boy who was operated on for a struma, which was removed by evulsion, causing aphonia, due to injury of the recurrent nerves. In this connection it may be well to mention a belief of the old Greek philosophers, the origin of which Galen, in confuting with much prolixity, ascribes to Zeno, the Stoic, it having been transmitted by Diogenes Babylonius and subsequently taught by Chrysippus.† Cicero‡ expresses it thus: "The trachea reaches from the lungs to the back part of the mouth through which the voice, taking its beginning from the mind, is perceived and has its origin." Galen says the Stoics reasoned thus: "It is evident the voice cometh from the mind. It is also evident it cometh from the larynx. Hence the mind is not in the brain." Galen demolishes this sophism thus: "They will wonder when they hear the voice is produced from the brain, and much more after having heard that all voluntary motion is performed by the muscles. * * * For the muscles move certain parts upon which the breathing and the voice depend, and they themselves in their turn are dependent on the nerves from the the brain. If you surround any one of these with a ligature, or if you cut it, you will render the muscle to which it is distributed motionless, as well as the limb of the animal which has moved before the nerve was cut." Another evidence of Galen's familiarity

* "De Locis Affect," I, 6. According to Baas, Marinus (100 A. D.) discovered the inferior laryngeal nerves. He gives no reference.

† *Vid.* Galen: "De Placitis Platon. et Hippocrat.," Lib. II.

‡ "De Natura Deorum," 11, 59: Primum enim a pulmonibus arteria usque ad os intimum pertinet, per quam vox principium a mente ducens percipitur et funditur.

with experimentation on animals in elucidating the function of the laryngeal nerves is to be found further on in the same chapter: "The bones being removed from the brain, or its ventricles in some manner compressed, immediately there is not only no voice or breathing, but the animal is at once deprived of all sensation and of all motion during the compression."

Humoral Pathology.

Galen adopted Hippocrates' idea, and thought health resulted from the proper equilibrium of the four humors, the temperaments so called, resulting from the preponderance of one or more humors. He applied the four qualities to the four elements thus:

Water	Cold and wet.
Earth	Cold and dry.
Air	Warm and wet.
Fire	Warm and dry.

He applied to the humors the theory of the elements. Every disease is engendered by one of the humors or several combined. "The phlegm is an imperfect blood which may become true blood by the action of the natural heat of the body. In the phlegm water is abundant. It is cold and wet like water. It nourishes the brain and all cold and wet parts. It tempers the blood and aids the movements of the articulations." We thus see it has directly to do with the mucous and serous membranes. In its other ramifications the description of the applications of this doctrine is prolix and fatiguing. Its adoption tended to suppress originality of thought, just as any system always does.

I have detailed at considerable length the indications of the anatomical and physiological knowledge which Galen possessed of the upper air passages, not only because in his work we first meet with any considerable notice of such knowledge, but because this knowledge formed the basis upon which rested for more than a thousand years the superstructure of theory and practice, until, indeed, it received from Vesalius and his followers a rational criticism, and eventually a refutation of his doctrines of pathology. The abolition of the latter by the physicians of the Renaissance and later, was a boon to suffering humanity. It was one of the many fetters which bound the human intellect—may we never see its like.

As to other passages of interest concerning the nose and throat in the works of Galen, those treating of their diseases need not detain us long.

Anosmia.

We have seen the defects in Galen's knowledge of the anatomy and physiology of the nose, and hence we need not be surprised

that he instances obstructive anosmia as a condition in which the air may pass through the cribiform plate to the brain without the odor—the particles of the latter being too large to pass through the perforations in the membrane lining the cribiform plate.*

As a further illustration of the supposed entrance of the air or rather of the "pneuma" into the brain, he instances the case of a man who after forcible inhalation of an irritating substance into the nose, suffered acutely with headache referred to the frontal region.†

Polypi and Ozena.

Galen seems to have divided diseases of the nose into two classes, polypi and ozena—corresponding, perhaps, to the modern classification of hypertrophic rhinitis, including edematous hypertrophy and polypi, and atrophic rhinitis including possibly syphilis, if it then existed. Elsewhere, however, among the Definitions (No. 371), he states that ozena is a deep ulceration in the nostrils, emitting a breath of a bad odor, and says: "Sarcoma is the unnatural growth of flesh within the nostrils. Indeed, a polyp is a kind of sarcoma. * * A sarcoma differs from a polyp in size and structure." His differentiation of nasal disease was, of course, very faulty. He gives a very large number of prescriptions, both of his own and others, for the so-called ozena and polypi, but his therapy for these affections is decidedly inferior to that of Celsus. There is no reference made to Hippocrates' method of removing nasal polypi. Considerable attention is given to epistaxis as a symptom of various general diseases, but not as much stress is laid upon this point as in the Hippocratic treatises. He, as did his predecessors, recognized the dependence of diseases of the larynx upon affections of the parts above, but they explained this by the assumption that the brain was the common origin of all catarrhs. We find in Galen abundant evidence of the influence of what I have called Chaldean medicine, the excrement of men and animals being freely used in throat inflammations. Bleeding from beneath the tongue was also a favorite remedy in all affections of the pharynx and larynx.

Varieties of Kynanche.

We have seen how Celsus and Aretæus subdivided inflammations of the throat into Kynanche and Synanche. Galen refers‡ to the book of Prognostics of Hippocrates to prove that all these inflammations were at first called Kynanche. Galen himself, while not disposed to increase the number of names, divides throat inflam-

* "De Usu Partium," VIII, 6.

† "Instrumentum Odoratus."

‡ "De Locis Affect.," IV, 6.

mations into five varieties. First, inflammation of the fauces. Second, difficulty of breathing with no inflammation of the fauces or swelling of the external parts. Third, when the region of the fauces externally is inflamed. Fourth, when the fauces internally and externally are inflamed. This all seems very nonsensical, but we must remember the influence of the school of Pneumatists. Although Galen supplanted all schools, he was by no means himself free from the influence of many of their theories. Fifth, in both Galen and Hippocrates there is a description of a throat affection which Galen explained as a dislocation of the odontoid process of the axis vertebra. I am entirely at a loss to identify this affection, unless it was a post pharyngeal abscess. They both speak of it as an affection more or less commonly met with, and Galen created a fifth class for it.

If any doubts have arisen as to the correctness of the assumption that diphtheria was known to earlier writers, the following passage from Galen should set the matter at rest. It occurs incidentally in Galen's treatise on therapeutics.* "For thus the youth having an ulcer of the pestilential disease in the trachea regained his health, and others in the same manner after him. In another youth, about eighteen years old, a cold having gone on for many days, a little fluid blood came up after a cough—not much—but after this he coughed up some part of the membrane itself, which, having remained behind in the trachea, came up through the larynx into the pharynx and mouth. It seemed to me from the apparent thickness of it and from the patient's sensations, it came from the body of the larynx. Thenceforth the man's voice was injured, and this for some time, but he eventually recovered." Diphtheria.

Thus far in making citations from the works of Galen I have refrained from quoting from "Iatros, or The Surgeon," a book usually included in the more authentic works of Galen. While the latter may have written the introductory parts, nothing can be more certain than that he is not responsible for the body of the work. Evidently it is the work of another and a much inferior hand. It is full of anatomical and physiological errors which Galen himself in his other works has refuted or shown that he did not share. Galen's great familiarity with Hippocrates would have prevented him from making the statement we find in the "Iatros" that if the nasal bones are broken they cannot be straightened. Galen in his "Commentaries on the Hippocratic Treatises," dealing with this subject, shows his perfect familiarity with the treatment of such Iatros.

* "De Methodo Medendi," Lib. V, Cap. 12.

cases.* We find also that the author, whoever he was, made the same distinction between kynanche and synanche as did Celsus and Aretæus, a distinction which Galen, as we have seen, distinctly repudiates. He agrees with Galen in attributing great importance to the epiglottis as a protection to the larynx, but he fails to add any precept of caution to his mention of the operation of amputation of the uvula to which Galen attached such necessary physiological functions. He speaks of the tonsils as four in number, one at each side of the fauces, and one at each side of the base of the tongue, this being the first mention of the lingual tonsil. He used a sharp, narrow spatula to separate nasal polypi from the bone, and afterwards shaved off the roots with a sharp knife. It is in this book that the assertion is positively made that Asclepiades actually performed laryngotomy in extreme cases of dyspnea, but there is no comment with the statement.

* Also in the "De Fascibus:" In the Basel Edition of Galen, 1561, Vol. VI, p. 591, et seq., may be found a number of woodcuts illustrating in the most graphic manner the methods Galen describes for nasal bandaging, including those suggested by Hippocrates, Phalera and Amyntas.

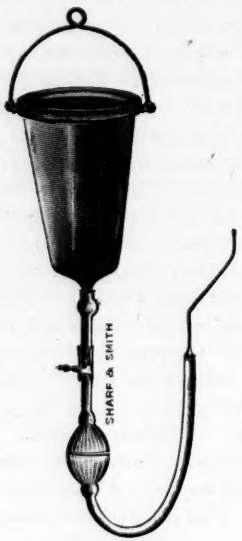
TREATMENT OF CERTAIN PURULENT CONDITIONS OF THE ANTRUM OF HIGHMORE THROUGH THE NATURAL OPENINGS.*

BY NORVAL H. PIERCE, M.D., CHICAGO.

The subject of this paper was chosen, first, because it is apparent that the ostium and accessory openings into the antrum of Highmore have not been used with the frequency they should be in the diagnosis and treatment of empyema; second, in order to make public the excellent results the writer has achieved in the treatment of certain purulent conditions of the sinus maxillare through the natural openings. Before proceeding to the chief part of this essay, it may not be amiss to take advantage of this excellent anatomical preparation from Dr. John W. Murphy's interesting collection, to make a few prefatory remarks on the parts involved. The hiatus semilunaris lies in the middle meatus. In order to see this, we raise the middle turbinated body and now we behold a rounded eminence, the bull ethmoidilis, which contains the aperture of the middle ethmoidal cells. Below this is the infundibulum which we may trace upwards and forwards to the opening of the frontal sinus. Its lower extremity leads to the sinus maxillare, which receives the openings of the anterior ethmoidal cells and the ostium maxillare. The form and size of the ostium maxillare varies greatly. Most frequently it is an elliptical slit; it may be round or kidney shaped. The smallest ostium Zuckerkandl has seen had a diameter of 3mm., the largest 19mm. It was absent in only two of his enormous collection of skulls. Beneath this is found what Zuckerkandl denominates the accessory openings into the maxillary sinus. These accessory openings are pictured also in Henle's "Handbuch der Anatomie" and in Cruveilhier's and Sappy's anatomical works. They usually occur bilaterally and they may be placed in any position in the middle meatus, but they are most frequently found in the regions of the hiatus semilunaris; they are oval or round in form with sharply cut edges and vary in size from a millet grain to a lentil; occasionally they are still larger. Giraldis believes that these openings are the result of pathological processes because they are not found in young

* Read before the Western Ophthalmologic and Oto-Laryngological Association, Cincinnati, April 11, 1901.

individuals. Zuckerkandl confirms this view inasmuch as he has observed rarefaction of the mucous membrane at points corresponding to these accessory openings. The importance of a knowledge of the existence of these openings must be clear to all who have to do with the treatment of disease of the maxillary sinus. According to Zuckerkandl these openings were found in 10 per cent of heads which he examined in his anatomical investigations. Hartmann believes that these openings are found more



frequently in persons suffering from sinusitis. We can see how readily the ostium in the specimen which I hold in my hand may be reached by passing a properly bent probe through the anterior nares along the middle meatus. In washing out the sinus I use Moritz Schmidt's canula; this is attached to a bulb syringe which in turn is connected with a gallon percolator jar. The apparatus may be held by an assistant during the process of irrigation or may be suspended by an iron standard at the level of the patient's

head. The amount of force of the current is regulated by pressure on the bulb of the syringe. It is unnecessary to say that a solution of cocaine and suprarenal capsule is used in order to contract and anesthetize the parts. It is best applied by means of a cotton carrier, the point of which is bent so as to enter well into the sulcus. Causes which preclude catheterization of the ostium maxillare are: narrow nasal chambers, deviations and spurs of the septum, polypi, hypertrophies, localized hyperplasia, synechia, osteophytes about the region of the hiatus and an inaccessible ostium. During introduction of the canula the patient's head is inclined somewhat backward. When the canula is in place the patient's head is bent forward in the median line and the solution from the nose is received in a receptacle held beneath the patient's chin. The canula is introduced under illumination with crook directed upward. When the point arrives opposite to the middle of the middle turbinated body, the instrument is gently insinuated into the middle meatus, and the opening into the antrum felt for. When the instrument passes into the ostium or an accessory opening, sight and touch make us aware of the fact. It is my experience that in many cases of antral disease the ostium or an accessory opening may be found without the aid of vision as easily as the opening of the Eustachian tube. With the aid of illumination and anterior rhinoscopy the procedure becomes much easier. Exploration of the ostium maxillare is by no means a recent device. The dentist, Jourdin, in 1765, employed this method to ascertain the patulanle of the ostium without illumination, depending entirely on the sense of touch. When the canula is in the sinus we have the choice between aspiration, inflation and rinsing the cavity. In the diagnosis of antral disease all of these procedures may be of value, but the latter procedure is the most important inasmuch as the exudate may be small in quantity or very thick and only appear in the washing. All fluids used in washing should be sterile and bland. For diagnostic purposes sterilized Thiersch's solution is the most acceptable. We will frequently observe, after such a washing, the entire disappearance of the symptoms of an acute empyema or they will be greatly diminished. Solutions which I have used in the treatment of maxillary sinusitis are: Thiersch's solution, solution of bicarbonate of soda, 2.5 per cent carbolic acid solution, saturated solution o boracic acid, aceto-tartrate of aluminum, (one ounce of the saturated aqueous solution to two quarts of sterilized water). It is needless to say that these irrigations can be curative only in un-

complicated empyemas; though cases of dental origin have been reported where healing has taken place notwithstanding the fact that the suspicious tooth remained. It is necessary in all cases to exclude all hindrances to healing, such as empyemas of neighboring sinuses, especially that of the frontal and ethmoidal. Polypi and hyperplasias or diseased teeth should receive the necessary attention.

One disadvantage of this method of treating disease of the maxillary antrum is that it necessitates a visit from or to the physician every time the antrum is irrigated. Very rarely do we find a patient who can find the opening himself, though I have seen such an instance. In most acute and in many chronic inflammations, however, the diseased conditions are overcome after surprisingly few treatments. The following cases will illustrate the results obtained :

Case I.—M. R., male, banker, æt. thirty-nine, sanguinous nervous temperament, was seized with a fever, rhinitis and pains in the head three days before I saw him. At the time he consulted me his temperature was 101.3° F., the pain was localized to the right side of the face and he was in a highly nervous state from loss of sleep. He complained of sensitiveness of the upper teeth on the right side. The discharge was muco-purulent and much more profuse on the right side. Translumination gave a marked right infraorbital shadow. The mucosa of the nose was greatly swollen. After thorough cocainization, muco-pus could be seen coming from the region of the hiatus. The canula was introduced with ease into an accessory opening. Purulent mucus in abundance came away in the Tiersch's solution, followed by clumps of thick brownish material. The patient experienced immediate relief and that night slept well for the first time since the beginning of the attack. Irrigations were continued daily, and the solution came away perfectly clear after the fifth treatment.

Case II.—A medical student, male, æt. twenty-three, had attack of grippe beginning ten days before I saw him. Temperature ranged during this time from 100 to 102.5° F. He suffered from severe pain in the frontal and temporal regions, photophobia, lachrymation and great depression. There was profuse discharge from both sides which possessed a disagreeable odor. Both cheeks were slightly edematous, and pressure over them elicited expressions of pain. The patient gave a history of a similar attack about a year before. After application of suprarenal capsule and cocain, both antra were irrigated through natural openings. Muco-pus came

away from both. Headache, lachrymation, photophobia were relieved almost immediately. The distressing discharge which with the headache had kept the patient awake was lessened so that he slept. His recovery was continuous and at the end of six days complete. About two weeks later he came to my office complaining of slight tenderness over the left antrum and increase of discharge from that side, which seemed to have an odor. Irrigation revealed a small quantity of thick yellowish pus, which disappeared after the tenth irrigation. It is not unusual to observe relapses in these cases. Indeed, it is probable that in many cases the acute inflammation is but an accentuation of a subacute or chronic process of so slight a character as to produce little or no disorder.

Case III.—S. K., female, married, æt. twenty-nine, complained of discharge and offensive odor from nose. The discharge was especially annoying at night as it ran back into the throat and caused cough; she suffered from recurrent attacks of neuralgic pain in the right side of face. Inspection revealed slight atrophy of both inferior turbinated bodies and the presence of thick muco-pus in both chambers. Translumination gave right infraorbital shadow, canulization slightly difficult. Irrigation brought away about two drachms of thick yellowish matter. Iodo-glycerine with vibratory massage applied to the mucosa of the nose. Patient employed irrigation by means of gravity douche twice daily at home. The nasal symptoms improved immediately. After about a month the solutions used in irrigations of the antrum came away perfectly clear. The discharge from the nose was reduced to a minimum. The neuralgic pains and odor had disappeared, and the patient's appearance and general health had greatly improved. Probably in many cases of antral disease the absorption of septic material by the mucosa of the antrum causes a low grade of pyemic poisoning.

Case IV.—B. K., merchant, æt. thirty-eight, married, complained of discharge into throat at night which awakened him and caused cough; he had similar attacks several times in past winter. Examination revealed tenacious muco-pus in the left middle meatus which during removal adhered to region of hiatus. Left infraorbital shadow on translumination. Irrigation through opening in middle meatus revealed muco-pus. Operation was advised but refused. The irrigations through the natural openings were carried on daily for three months, at which time the solution came away perfectly clear. He was kept under observation for six months without relapse occurring. Here we have a chronic sinusitis cured by irrigation through the natural opening. Relapses, however, are common.

Therefore the patient should be kept under observation for a long time. Cases might be multiplied but that is unnecessary for our purpose, above quotations from my records being sufficient to show what may be done. It should be understood that not all cases may be treated through the natural openings, and that not all cases which may be reached through such openings will recover without further surgical interference.

In conclusion, I would say:

1. That there is strong evidence to warrant the belief that in diseased antra accessory openings are more frequently found than in healthy antra.

2. That in a certain number of cases the ostium may be used to irrigate the antrum.

3. That we should in all cases, whether for diagnosis or treatment, try for the ostium or accessory openings before resorting to surgical puncture, whether through the inferior or middle meatus, the canine fossa or alveolar process.

4. That it is of no importance whether the opening through which we irrigate be the ostium or an accessory opening.

REMARKS ON THE DIAGNOSIS OF ADENOIDS IN INFANCY.

BY WALTER F. CHAPPELL, M.D., M.R.C.S., ENG., NEW YORK.

In most infantile affections it may be conservatively stated that the diagnosis is more difficult and uncertain than at any later period of life.

I am fully aware that the subject of adenoids has frequently received your attention, and I do not expect to present anything new to a society whose members are specially skilled in these ailments. Nevertheless, I venture to relate my observations, believing that your discussion will awaken new interest and prove most instructive.

In a general way we can divide the diagnostic symptoms into objective and subjective. The objective symptoms are peculiar facial expression, mouth breathing, snoring at night and noisy respiration during the day, vocal changes, abnormal and excessive nasal secretions, sneezing and reflex neuroses, chest deformities and spinal curvatures. The subjective symptoms are headaches, stuffy feeling in the nose, dryness of mouth and throat, especially in the mornings, and sore throat, impairment of the taste, inability to concentrate attention, with more or less stupidity and depression, earaches, deafness and tinnitus.

It seems unnecessary to consider in detail all these symptoms. I choose rather to take the negative side and show that of the symptoms enumerated, mouth-breathing and snoring may exist without adenoids being responsible; and also that adenoids may be present without causing any obstructive disturbance in the upper-air tract.

For expediency and clearness the age of three years and under will be taken as the period of infancy, and a further division will be made of those infants over six months, and those of six months and under.

The reason for making this division is that in early life some affections exist which a few months later either change their character or entirely disappear. Special difficulties also surround our methods of diagnosis at this early period, as, owing to the position of the soft palate and the small diameters of the naso-pharynx, it is impossible to make either a digital or posterior rhinoscopic examination.

Two of our most important aids are, therefore, rendered unavailable, and it is surprising that so many have been willing to make a diagnosis of adenoids without more positive evidence. During a recent examination of four hundred and thirty-seven infants under three years of age, forty-five were found under seven months old who had some nasal obstruction, but in no child under three months was the obstruction due to lymphoid hypertrophy in the naso-pharynx. In fact, in my experience I have been unable to demonstrate to my satisfaction the presence of adenoids in so young an infant. Occasionally I have thought I had a case, but was disappointed to find that no appreciable amount of lymphoid tissue could be removed. Since I began to doubt the theory of congenital adenoids I have employed an ear curette as a means of diagnosis in all suspected cases with negative results.

I might say at this point that until about two years ago no adenoid instruments could be obtained small enough to use in the post-nasal space of infants, and as the index finger is too large, I have been curious to know what means were adopted in those cases selected for operation. I have investigated the literature of congenital adenoids and find that most writers treat it indefinitely, stating usually in a brief way the probability of their presence at birth, but no author, so far as I am able to find, relates any definite personal experience.

Hall, in his work on the "Throat and Nose," says that adenoids would seem in some rare instances to be congenital, but that no dissections of new-born infants had confirmed this theory. Some years ago I made a number of post-mortem examinations on new-born infants, but found no case of adenoids. I think, therefore, the evidence is rather against the congenital theory, and, if true, this is an important point to be remembered in determining the cause of noisy and obstructive respiration.

The following conditions may cause respiratory obstruction simulating that caused by adenoids in the naso-pharynx of infants under six months:

1st. Lymphatism and lithemia.
2d. Syphilitic or gonorrheal rhinitis.
3d. Congenital atelectasis.
4th. Digestive disturbances.
5th. Congenital highly arched palate.
6th. Very small or occluded nostril or nasal passages.
7th. Unusually small post-nasal space with large Eustachian eminences.

8th. Marked anterior projection of the bodies of the cervical vertebræ.

9th. Some malformations of the soft palate.

10th. Hypertrophy of the tongue.

Some of the conditions enumerated are rare, but all have occurred in my experience, and should be given consideration in every case where the cause of obstruction is not evident. This would prevent many mistakes and lessen the disappointment experienced when operations have been performed for adenoids without giving the expected relief.

Lymphatism.—This name alone opens a rich field for thought and discussion. I intend only at this time, however, to touch on the ways it may influence the upper respiratory sounds. The upper air tract is a favorable location for the early manifestations of lymphatism, either in the severe and rare form of leucemia or in the so-called lymphatic temperament or lymphoid diathesis.

The latter now claims our attention, as its presence is usually apparent in the enlargement of the faucial tonsils and other lymphoid tissues in the pharynx and on the base of the tongue. There are some cases, however, where the cervico-bronchial glands or the mucosæ of the trachea and bronchi are principally affected. In these cases the manifestations appear very early, and, in my belief, may even be present at birth. The mucous glands may alone be implicated, or it may extend to the dense network of lymphatics and lymph nodes surrounding the trachea and bronchi. In either case the lumen of the tracheo-bronchial tract is narrowed and considerable stenosis results.

Under ordinary circumstances no marked symptoms of respiratory embarrassment might be evident until the child cried or during feeding. At these times what had been only a little hard breathing now becomes a labored and noisy respiration from the child's efforts to get sufficient volume of air, and presents a marked resemblance to obstructive adenoid breathing. The difference between them is that in all degrees of obstruction above the uvula the infant is obliged to remove the nipple from the mouth every few moments to obtain air. When the obstruction is lower down the nipple can be retained in the mouth during the entire period of feeding. Furthermore, when stenosis of the tracheo-bronchial tract exists, sonorous and asthmatic chest sounds may be heard while the child is nursing, which cease immediately when feeding is over.

Lithemia.—The lithemic diathesis may be manifested at an early age by recurring attacks of rhinitis, pharyngitis, trachitis and bronchitis. Infants of this type may have a family history of rheumatism or gout, which renders them extremely sensitive to exposure or any change of temperature. Crying, feeding, or anything which disturbs the vascular supply of the upper air tract, may produce temporary symptoms of obstructed respiration. Recurrent naso-pharyngitis is frequently seen in these lithemic teething infants, and produces a condition which might readily be mistaken for a recurrent inflammation in a small adenoid. A case of this kind has recently been under my care. The primary attack began when the infant was four weeks old, and recurred at intervals of about six weeks until it was nine months old. It then had its most severe attack, accompanied by an acute follicular tonsilitis, and followed a week later by a severe rheumatic infection. Erythema papulata appeared over the surface of the body, accompanied by severe acid perspirations, irritable bladder and a temperature ranging from 101 to 105 F. These symptoms lasted about four weeks, when convalescence began. In all the attacks the first symptom noticed was the child's refusal to take the bottle, or that it would take only an ounce or two at a time. An examination of the throat showed that the pillars of the fauces and the posterior pharyngeal wall were swollen, red and dry in appearance; later the mucous glands became prominent and stood out like small beads over the surface of the membrane. In forty-eight hours the membrane looked edematous and began to secrete a clear fluid, which soon became white, thick and tenacious, and could be removed from the throat and nose in long, firm strings. The quantity of this secretion was surprising, and it completely occluded the naso-pharynx and nasal passages. The complete cycle of an attack lasted about seven days, when the child again took nourishment in usual quantities and soon returned to its normal state of health.

The lithemic infection is usually confined to the superficial tissues, but may spread beneath the pharyngeal aponeurosis, forming a small retropharyngeal abscess, which may increase gradually in size for a period of several months and produce a great deal of respiratory disturbance.

Either syphilitic or gonorrheal rhinitis may cause prolonged nasal stenosis. The former class of cases are the most frequent, and can be easily diagnosed if other manifestations are present. If, however, the infant has every appearance of health and thrives well, the

cause of the rhinitis may not be suspected. Gonorrheal infection of the nasal mucous membrane is happily rare. The diagnosis is not difficult as the infection commences in the eyes.

Congenital Atelectasis produces respiratory symptoms which may sometimes be mistaken for adenoids by competent observers. If considerable lung tissue is involved the symptoms are so marked that a mistake should not occur. If little lung tissue is implicated the condition of the respirations might not be readily understood.

Digestive Disturbance.—In some infants we have digestive derangements accompanied by vomiting and regurgitation of large curds of milk. The latter may in some instances lodge in the nasal passages and naso-pharynx, producing more or less nasal stoppage and noisy, labored breathing. The size and firmness of these impacted milk curds would suggest that they had been some time in forming, and that they were subjected to considerable pressure and rotatory movement from the action of the pharyngeal and palatal muscles.

Billard claims there is a non-traumatic esophagitis, which accompanies stomatitis and gastro-intestinal irritation, and may produce considerable pressure on the trachea and larynx. He describes cases and verifies his statements by a number of post-mortem examinations. Two patients have been under my care with symptoms similar to those described by Billard, and I could make no other satisfactory diagnosis.

Congenital hypertrophy of the tongue is also rare. I have reported two cases and have seen one other. One of the reported cases was very interesting because of the amount of respiratory obstruction.

Mr. H. had a large tongue from birth, which had always protruded between his lips, and throughout his life had caused many alarming attacks of suffocation, chiefly at night. When four years of age its increasing size and unusual appearance induced his mother to consult several surgeons as to the advisability of removing a portion of the tongue. After his fifteenth year the lingual veins became so engorged at times that it interfered greatly with his respiration, and on one occasion tracheotomy was contemplated for relief, but the application of leeches to the tongue made this unnecessary.

Children between six months and three years of age may suffer from the ailments we have just considered as belonging to early infancy, but they have also other conditions which are not present at so early a period. The following table will be interesting as showing the relative frequency of age and abnormalities found in the four hundred and thirty-seven children I have already alluded to:

181 infants were 3 years old.
48 infants were 2½ years old.
100 infants were 2 years old.
62 infants were 1 year old.
27 infants were 6 months old.
18 infants were under 6 months.

Of these:

87 had adenoids alone.
80 adenoids and enlarged tonsils.
44 hypertrophied tonsils without adenoids.
50 hypertrophic rhinitis.
21 foreign bodies.
20 eczema nares and folliculitis alæ nasi.
13 specific rhinitis.
4 deflected septa.

The balance suffered from more or less acute affections, not of special interest at this moment.

On glancing over the foregoing list, many conditions will be recognized as liable to produce marked nasal obstructions. Large tonsils alone may cause snoring and mouth-breathing. A superior or inferior hypertrophy of the tonsils may produce these symptoms. In the former the upper extremity of the tonsil is buried in the soft palate and adhering to its pillars, greatly diminishes the lumen of the naso-pharynx. When the prolongation of the tonsil is downward it may extend along the lateral wall of the pharynx to the top of the larynx, diminishing the lumen of the laryngo-pharynx and causing noisy, labored breathing. I might, incidentally, state that any inflammatory changes in an inferior hypertrophy of the tonsil places the child in imminent danger of suffocation, especially if there is any suppuration.

Hypertrophic rhinitis is common in children, and is usually manifested by an enlargement of the anterior and posterior ends of the inferior turbinated bodies and an increase of erectile tissue on the posterior margin of the vomer. These conditions are frequently mistaken for adenoids, but as they may accompany adenoids, it is important that their presence should be looked for and understood. On several occasions I have seen children whose naso-pharynges had been successfully cleared of all lymphoid tissue, but as the nasal obstruction was not relieved, the physician was blamed for an incomplete operation. The hypertrophic rhinitis in some instances is not sufficient to obstruct the breathing, but the great quantity of mucus secreted and the inability or neglect of the child to blow it out, produced the stoppage.

Foreign bodies, sueh as shoe buttons, small stones and medicinal tablets, are frequently put in the nose by children without the parents' knowledge. A discharge and snuffling of the nose soon appears, and if the cause is discovered it is at once relieved. If, however, the foreign substance is not found, but remains for years in the passages, it becomes incrusted with various salts and imbedded in granulation tissue until it is difficult to locate. The nasal stenosis does not come alone from the foreign body, but from an accompanying irritative rhinitis.

Septal spurs, ridges and deviations produce more or less nasal occlusion. They are not common in children under three years of age, but occasionally a deviation from traumatism may be found. When the anterior margin of the triangular cartilage is displaced to either side, even slightly, it may cause a valvular action of the alæ nasi during inspiration, which occludes the passages.

As I have already stated, we may have adenoids without any mouth breathing or noisy respiration. This would indicate either a very wide or highly-arched post-nasal space or that the lymphoid tissue should be in a single clump, immediately behind the septum or in small flattened clusters, well distributed over the surface. Other symptoms usually lead to the discovery of the adenoids, such as recurring earaches, intermittent hoarseness, frequent colds, constant hacking cough, croup or profuse post-nasal discharge. Headaches, paroxysmal sneezing, continued dry nasal sniffing, asthma, choreic movements of the facial muscles, nocturnal enuresis, night terrors, glottic spasm, and many other remote reflexes are added by some to this list.

We cannot be too careful in avoiding the limited opinions which special practice is apt to cultivate, and in view of the varied causes of obstructed and noisy respiration, we should exercise the greatest care in the diagnosis and treatment of all affections of the upper air tract of infancy.

7 East Fifty-fifth street.

DIFFERENTIAL DIAGNOSIS OF AFFECTION OF THE EUSTACHIAN TUBE AND SPONGIFYING OF THE LABYRINTH.*

BY J. HOLINGER, M.D., CHICAGO.

The two conditions are pathologically widely different. The functional result is, to a certain extent, the same in both, namely, a higher or lower degree of deafness. The text-books give very little positive information about either disease. Affection of the Eustachian tube is hardly mentioned as a separate clinical entity; instead, we find indefinite references to the nose and naso-pharynx as causing numerous affections of the middle ear. Therefore, allow me to draw first a sketch of the clinical picture of the *affection of the Eustachian tube.*

It occurs in all ages and in both sexes. Deafness with or without noises, pain and stuffiness in the head, are the predominating features. The objective signs in a typical case are as follows: The drumhead is retracted. There is a sharp sickle-shaped fold of the membrane from the short process backwards, often another one forward. The mallet is foreshortened and the light reflex is reduced to a point in the umbo or has entirely disappeared. Shrapnell's membrane is sunk inward and sometimes shows light reflexes as if from a hollow hemisphere, or one or two folds cause a couple of streaks of light reflexes from the short process upwards. In the nose we find a great many changes: Hypertrophies of the inferior turbinal, especially its posterior end, and spurs and deviations of the septum. In examining, I do not put the question in this way: "Is there anything that might interfere or clog the Eustachian tube?" but rather, "Is there anything in the nose that is liable to irritate the nose and keep up a certain amount of swelling and redness?" I would not remove, *e. g.*, a large ridge of the septum or hypertrophy of the turbinals, if air passes freely through the nostrils, if cold in the head rarely occur, or if the membrane looks rather pinkish. But I should not hesitate to operate, when a velvety, swollen, bluish-red or bright red membrane covers even slight hypertrophies, and the patient complains of a cold every two or three weeks. For the examination of the naso-pharynx, besides the mirror, I use Lindt's

* Read before the Western Ophthalmological and Otolaryngological Society, Cincinnati, April 11, 1901.

palate hook, with the head thrown back. I consider this examination most valuable, especially for lateral pharyngitis. The examination of the tonsils is made according to Killian. These two methods allow us to discover swellings and reddenings in the neighborhood of the orifice of the tube and especially below the tube, on the posterior pillars of the soft palate, and high up on the rear wall of the pharynx. An important point in the diagnosis is the catheterization. Before using the catheter, the hearing distance is taken. The catheter is used always with the hearing tube, and the character of the sound produced by the air entering the middle-ear is carefully observed. This sound must be harsh, loud blowing, apparently produced in the examiner's own ear, free from bubbling or other accidental noises. Smooth and low sounds that appear to be rising from far off are suspicious. After inflation we make another hearing test. *In affections of the tube there is an increase from two to ten times the original hearing distance.* At the same time all signs of retraction of the drumhead have disappeared, of course, only to return after a longer or shorter period.

I may fill out this sketch still more, and add two conditions which are liable to frustrate a diagnosis and a successful treatment. The first one is the smoker's catarrh, from which, in our smoky city, not only smokers suffer, but almost everybody. The second arises from the fact that the pharynx is, at the same time, a part of the alimentary tract as well as of the respiratory. As such it takes a part in the diseases of the stomach and esophagus as well as of the nose and mouth. Disorders of the stomach may keep up a chronic pharyngitis, which in itself is inaccessible to treatment, and frustrates all attempts to diagnose or cure the resulting affection of the tube. Two cases may illustrate these last statements. Mr. G. S., age twenty-one, druggist, came first under my observation in the fall of 1893, with complaints of increasing deafness, lasting for several months. The hearing distance was then, in the right ear, for whisper, 2 meters before and 4 m. after catheterization; in the left ear, 1 m., and after catheterization 2 m. Rinné's test in both ears was shorter than normal, +10 sec. right, +8 sec. left; lower sound limits normal. I inflated and massaged the ears regularly every other day; I forbade smoking; I cauterized and painted the pharynx. He got worse until he could not attend to business. In 1897 I took the following notes of his condition. Both membranes slightly retracted; right one does not become normal after catheterization. Hearing distance in the right ear, before and after inflation, 30 cm. (1 foot); in the left

ear, 25 cm. for whisper; Rinné's test, right ear, —10; left ear, +10, not quite definite. The lower sound limit was a little higher than normal, but not definite. Weber-Schwabach, same in both ears; normal as to duration. I was not persuaded about the differential diagnosis of the sclerosis, as I called it then, and the affection of the tube, but there was more evidence in favor of the latter. Therefore, I insisted upon a longer period of sojourn in Mexico. The patient stopped smoking, and returned after two years with normal hearing and a normal pharynx.

The second, Dr. X., age thirty-two, was first examined June 18, 1898. Father hears only loud shouting. Patient became more and more deaf during last two years. Air enters through the catheter into both middle ears with a soft distant sound. Hearing before catheterization, 1 m.; after, 2 m., in both ears. Rinné's test was negative in both ears and the lowest sounds were inaudible. Weber-Schwabach was not markedly prolonged. The pharynx was bluish-red, velvety, swollen. Galvano-cautery, as well as painting with Mandl's solution, was without immediate result. Improvement to normal came *spontaneously* when *careful diet* cured a chronic gastritis, which had caused no other symptoms but the pharyngitis. The nose was always free on both sides.

These cases offered some difficulties to differential diagnosis. Still, the result of the functional tests was typical in neither of them. The nose in both were free. Rinné's test changed repeatedly in the first patient, so that it was sometimes negative and at other times positive. In the second one Rinné's test was negative until the gradual improvement set in. The fact that the father of the patient was deaf spoke much in favor of spongifying.

Now, compare with this picture the one described in spongifying of the labyrinth.* First, heredity. Very often some relative is affected in a similar manner. Second, the *onset* of the disease dates very rarely further back than the eighteenth to twenty-fourth year of life. The main complaint of imperceptibly beginning and slowly increasing deafness is the same as in affection of the tube, and likewise many other of the subjective symptoms give us no clew. Sudden increase in deafness and heavy cannon-shot-like detonations are often found in spongifying, while in affection of the tube sudden improvements are sometimes observed. Third, more definite is the result of the *objective examinations*. The drum-head is found normal or nearly so. Perhaps we find the typical red intermediary zone, which is pathognomonic of sclerosis or spongify-

* THE LARYNGOSCOPE, Vol. X, No. 1. Holinger: "Spongifying of the Labyrinth."

ing. It is hardly necessary for me to enter into the details of the findings of sclerosis, which are set forth in every text-book. The nose and naso-pharynx and pharynx, however, are normal, or very nearly so. They are often rather pale in patients, who show no other signs of anemia. No trace is found of the redness and swelling of the posterior wall of the pharynx. The nose is wide, and exceptionally are hypertrophies found. The functional tests are as follows: The sound of the air entering the middle-ear in catheterization is harsh, apparently arising in our own ear. The hearing distance is increased very little, or not at all, after catheterization over what it was before. Finally, we have the three typical findings of the functional tests—shorter or negative Rinné's test measured in seconds. Furthermore, increased bone conduction for the lower sounds, tested with (A) fork without weights ; third, a defect of hearing at the lower end of the normal scope of hearing. The extent of this defect varies, and does not necessarily correspond with the decrease of the hearing in general. I found defects of two or even three octavos where the decrease of hearing for whisper was very small, but also defects of one to one and a half octavos where the hearing was beyond a whisper close to the ear.

There are some diseases where you can make a diagnosis from one or two symptoms alone, but this is not one of them. Only by considering the picture as a whole will you be able to get an idea of the condition. You have to weigh the different factors and compare them. If you cling to one symptom, or even one group of symptoms, exclusively, you are bound to make mistakes. A complete command of the technic of the examination will help you greatly. Large experience in examining the nose and naso-pharynx is indispensable. Zeal and interest in the subject will help you over the first period of disappointments. If you start with a critical, or prejudiced sentiment, you cannot but fail. In closing, I simply state the fact that in all cases which came to a post-mortem, the diagnosis, made some ten and twelve years previously, was confirmed. Objections against the method would only be logical, if in a case where the diagnosis has been made, the post-mortem would not show a trace of the typical findings of spongifying.

DISEASES OF STENSON'S DUCT AND THE TREATMENT.*

BY CARL E. MUNGER, M.D., WATERBURY, CONN.

The excretory duct of the parotid gland is composed of small[1] branches originating in the gland itself and uniting in one common trunk, passing over the masseter and through the buccinator muscles, opens into the buccal cavity on the inside of the cheek opposite the second molar. The walls are dense and consist of an outer fibrous coat with contractile fibres and an inner mucous coat lined with columnar epithelium. Upon the integrity of this duct is dependent the normal flow of the parotid saliva, which forms such a large proportion of the glandular secretion which is important in buccal digestion. Whenever there is a closure, partial or complete, of these ducts, that becomes permanent, the resulting changes in the parotids themselves must be disastrous to function and structure. The diseases of this duct are either primary or secondary, and are temporary or permanent.

The primary diseases of Stenson's duct are:

(a) Inflammation, acute or chronic.

(b) Formation in duct of calculi.

(c) Injuries to duct.

The secondary diseases are:

(a) Occlusions of duct following acute inflammation.

(b) Following excessive salivation.

(c) Impaction of calculi.

(d) Stricture due to healing of wounds.

(e) Ulceration of duct or abcesses in duct due to impacted calculi.

(f) Stenosis and ulceration due to impaction of foreign bodies.

(g) Cystic dilatation due to simple inflammation or cicatricial obstruction and suppuration.—"Amer. Text-Book of Surgery," p. 635.

(h) Fistulæ.

An acute inflammation of Stenson's duct, which is strictly primary, can be due only to exposure to cold or extension by continuity of an existing inflammatory condition in the mouth. A marked case came under my observation September 25, 1899.

Mrs. S. G. woke up on the 20th of June after exposure to cold and wet the day before on board an ocean steamer, and found she

* Read at the seventh annual meeting of the American Laryngological, Rhinological and Otological Society, New York, May 24, 1901.

could not open her mouth wide, and had a swelling in front of the right ear, and in addition presented the symptoms of an acute cold; her eyes were swollen and her throat was sore. She said that at the time of her first visit to my office that it seemed as if her head and throat were all filled up. She also complained of a feeling of fullness in the right ear, and stated that her mouth was apt to be dry. Examination showed that the ear was normal. There was a large, hard swelling of the right parotid gland, with no especial tenderness. There was also a hard cord-like feeling along the course of Steno's duct. The duct would admit only a small probe and for only a short distance at first, but repeated trials finally were successful so that the small probe could be introduced the whole length of the duct, and gradually probes of increasing size were passed until the duct was thoroughly and permanently dilated, with the result that the flow of parotid saliva was normally established and the gland itself practically reduced to its proper size.

The Formation of Calculi in the Duct Itself probably occurs only where the[2] lining of the duct has been roughened or thickened or a partial or complete stenosis has resulted with an accompanying decomposition of the parotid saliva.

Injuries to Stenson's Duct may be due to the traumatism of operations, or to injuries occurring in this region resulting in laceration or cutting of the duct, and the duct may also merely be contused or there may be a[3] subcutaneous laceration with no opening externally upon the face or internally within the cheek, in which case there will result a swelling of the cheek due to infiltration of saliva into the cellular tissue.

Occlusions of Stenson's duct occur as a result of adhesions following[4] acute inflammations or violent salivation, or after scarlet fever or diphtheria or gangrene of cheek, or may occur in the course of low fevers.

The healing of wounds of the cheek may result in stricture of the duct, either partial or complete, and if partial, may become temporarily complete from external influences, such as cold, etc. There may be a stenosis as the result of an ulceration or abscess due to an impacted calculus, and there may be a stenosis due to the impaction of foreign bodies other than salivary calculus, such as[5] hair in the duct,[6] fish bone, bristle from tooth brush,[7] small bearded tail of a chestnut, etc.

Salivary fistulæ, more especially those due to changes in Stenson's duct, have received much attention in the past and much ingenuity has been displayed in repairing the ravages which have occurred from stoppages in the duct. These fistulous openings

may take place from any part of the duct or may occur directly from the parotid itself, or the external opening may be at a considerable distance from the parotid, due to burrowing of the parotid saliva in the cheek wall. These fistulæ may open externally or internally, but as is the case with fistulæ in other parts of the body the openings are much more frequently to be found on the external surface. There may be one or more fistulous openings, the multiple openings being more often the rule, when the fistula is from the parotid itself.

The diagnosis of a parotid fistula, or fistula of the duct, is frequently simple, and when it is obscure a test of the escaping fluid will determine whether or not it is salivary in character. One test is that given by Robert's tincture chloride of iron, mixed on a white surface with the suspected fluid, will give a pink reaction with the sulphocyanide of K present if saliva is mixed with the discharge. Another is utilizing the power of the saliva to convert starch into sugar, and detecting it with Fehling's solution, and also by the disappearance of the starch and the inability to detect it with the iodine test.

The Treatment of these Cases of Stenosis will depend upon the character and cause of the trouble and the resulting after-effects. When the stricture is due to acute inflammation, gentle probing of the duct will relieve the damming up of the parotid saliva and in a short time the duct will remain permanently patent.

When the stenosis is due to formation of a calculus or calculi in any part of it, the method of procedure must depend upon the position, size and consistency of the stone. Probing and manipulation may be sufficient if the calculus is small, and especially when it is near the buccal orifice. If it is large or hard, or is surrounded by inflammatory adhesions, or there has been an ulceration through the wall of the duct, then excision must be resorted to and, of course, the operation should be an internal one to prevent an external fistula. If the calculus is near the gland itself an external operation may be necessary.

Injuries to the Duct, whether due to accidental traumatism or occurring in the course of operations in this region, should be attended to at once to prevent that lamentable condition, salivary fistula.

Occlusions of the duct may be due to more than one stricture, in which case much time and patience will be exhausted before these can be sufficiently and permanently dilated. These dilatations may be accomplished by the use of flexible probes of varying size and increasing diameter, and where the strictures are dense

and the lumen of the duct at these points very small, electrolysis might be utilized with great hope of success—though I have not had any experience with this method of procedure—or a canaliculæ knife might be used with after dilatations with probes.

Stricture due to the Healing of Wounds, or ulceration of the duct or abscess in the duct due to an impacted calculus, will be with difficulty, and often never, overcome by dilatation alone if the injured ends of the duct do not remain in apposition. When such is the case a fistula will result and must be treated accordingly.

Stenosis due to Foreign Bodies must, of course, be relieved by the removal of the cause, and this becomes more and more difficult according as the substance is located more and more deeply in the duct. If near the buccal orifice dilatation and the use of delicate forceps will usually be satisfactory. If the foreign body is more deeply lodged, then the duct must be slit in order to reach it, and if near the glandular end of the duct an external operation will be called for and the case becomes one of injury to duct from operative measures.

The Methods of Treatment of Salivary Fistulæ are too well known to more than refer to them. In the recent cases the mere covering of the external surface of the cheek over the seat of the fistula, with collodion, or the use of adhesive strips, or the use of suture may be all sufficient and the flow of saliva will be immediately directed inwards and the external opening will heal. But in the more chronic cases all sorts of expedients must be resorted to. The fistulous tissue may be excised and the fistula then treated as a recent one; or the distal end of the injured duct may be dissected out and sutured inside the cheek, and closing the external wound as before. A drainage tube has been inserted through the fistula, gradually pulled through the cheek walls, leaving only a small external opening which may be readily closed, or a seton may be used by passing a large cord through the fistula and through the whole thickness of the cheek, and its two ends tied together at the angle of the mouth. This is moved back and forth frequently until a flow of saliva becomes established inwards and the seton removed and the external wound closed as before. This latter method is one of the oldest, and in many cases is the easier of application and is successful.

There is a condition which presents itself rather frequently, when the patient comes to you with a swelling of the parotid of some time standing, where the question of making an external opening into the gland must be considered. If there is present pus or broken-down gland tissue, there is no option, and an external opening must be made and the diseased tissue thoroughly removed, but it must be re-

membered that a parotid fistula results, and the treatment has but begun. If the duct cannot be dilated and the parotid swelling reduced, an exploratory aspiration should be made, and if the escaping fluid is not purulent every effort should be made to dilate the duct or perform some operation which will direct the flow of saliva into the mouth by some one of the methods which have been mentioned for curing a salivary fistula from the duct itself. If pus is formed an external opening of sufficient size must be made, the pus allowed to escape, and the broken-down gland tissue thoroughly curetted and then proceed to render the duct patulous or to make an artificial path for the saliva by which it can reach the mouth.

There is still another class of cases where stricture of Stenson's duct causes a swelling of a lymphatic gland or glands at some distance below the parotid itself, and there is a resulting breaking down of gland tissue. This condition is undoubtedly due to the[8] fact that the parotid lymphatic glands have efferent vessels passing to the so-called ectal cervical lymphatic glands which serve as channels for the passage of the infecting cause. The treatment of this condition is the same as that for any broken-down lymphatic gland, together with the treatment which has for its result the rendering of Stenson's duct patent.

As examples of pathological curiosities may be cited: The cases where[9] masticating food stimulated the parotid gland to such an extent that the quantity of saliva poured out was so great that the temporary result was practically that of a stenosed Stenson's duct, and the saliva transuded through the skin.

Two cases reported by Hyrtl and Deichmüller where the parotid gland contained air;[10] a case of spasmodic closure of the duct resulting in an acute marked enlargement of the parotid which lasted for two hours;[11] a case of paroxysmal swelling of the parotid glands in a female due to hysteria, was called angioneurotic edema, or it was due to air entering a rigid Stenson's duct.

In closing, I would like to emphasize that a stricture may be due to a simple inflammatory condition due to cold. That more than one stricture may be present, that the parotid tumor may or may not contain pus, and that in dilating Stenson's duct it will be found necessary frequently to use flexible probes or bougies, which may be bellied or bulbous, and that gentleness and patience must be combined with skill and knowledge in the treatment of this interesting class of cases.

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SOCIETY PROCEEDINGS.

WESTERN OPHTHALMOLOGIC AND OTO-LARYNGOLOGIC ASSOCIATION.

(Proceedings continued from page 146.)

Auscultation of the Mastoid. DR. ANDREWS (Chicago).

This paper was published in full in THE LARYNGOSCOPE, June, 1901, p. 416.

DISCUSSION.

DR. BALLENGER: I believe that auscultation of the mastoid with a stethoscope and fork will be of some value to us in arriving at the condition of the temporal bone with its antrum and the accessory sinuses. I think we can say the method is not new, as I am informed by a physician that while in Edinburgh he found the stethescope was used over the mastoid in the Royal Infirmary of Edinburgh and in the clinic held by Logan Turner. While from these two references we may infer that the method is not new, we must also acknowledge that it is one of value and therefore should be considered. That it is not in use generally in this country is certainly evident, because I have known of no one who makes use of it except Dr. Andrews. I have, at Dr. Andrews' request, done a little testing, and have satisfied myself that the test is one of some value. I do not, however, believe it is of paramount value in diagnosis. There are other methods by which we can arrive at the same conclusions. If we will use transillumination of the mastoid in a dark room, we will find when morbid material is present that light is not transmitted to the external meatus; and by comparing the two sides it may be seen at once that the conditions are different.

Nevertheless, Dr. Andrews has brought to our attention a method which can be used in addition to those already at our command, and it is certainly an interesting one. I think he called attention in his paper to the fact that the fork must be elevated when changing its position on the mastoid, otherwise the skin may be compressed between the handle of the fork and the bell of the stethoscope, thereby greatly augmenting the intensity of the tone. Great care should be exercised in this regard else a wrong

conclusion may be reached. I think the test is of great value, as Dr. Andrews has stated, in locating the lateral sinuses. The difference in the tone over the lateral sinus and when it comes further forward is very apparent and very striking. I commend the observations as set forth by the essayist and shall certainly make use of them.

Dr. J. A. Stucky (Lexington, Ky.): I feel that the committee in selecting me to open this discussion has done like some people do with their horses—outclassed me. I feel incompetent to speak on the subject, because I know nothing about it. The essay has been one of great interest to me. Dr. Ballenger says the method described in the essay is not entirely new, but I do not know that it is the new things we are after so much as the true—the facts not theories. If this method can aid us in determining the presence of pus in the antrum and possibly locating the lateral sinuses, it is of inestimable value to us. In my experience I have never had a case of cerebellar abscess. In regard to operations upon the mastoid I am inclined to be on the conservative side and to question whether we are not frequently too hasty in resorting to the major or radical method. I have opened only fourteen or fifteen mastoids myself but have seen many others opened, and have seen but one sinus thrombosis and no cerebral abscess. I would like to ask Dr. Andrews if he has tested this method in examination of the other sinuses, for instance, the frontal sinuses and the antrum of Highmore? Also, can he tell by this method of auscultation the difference between pressure of pus in mastoid cells and the eburnated or sclerosed condition?

Dr. Stein: In regard to the method suggested by the paper, I have used it a few times at the suggestion of Dr. Andrews. Recently I had occasion to use it in a case I operated on afterwards. I was somewhat misled in my results in the examination. I do not know as that stands as a criterion at all in the results I may attain in the future. This case was one of empyema of the mastoid. I heard the tone strong for twenty-two seconds over the affected side, and on the opposite side I heard it for a like time, twenty-two seconds. I knew there was a mastoid abscess there. There was no question of diagnosis. The patient had shown all signs of brain complications. On operating I found dense, compact bone for quite a distance covering over a large necrotic cavity. Probably the density of the bone which overlay the region of the cavity was responsible for the unaugmented condition of the sound. Where you

have dense bone you are going to have augmentation in the sound. In the examination of quite a few normal cases, I have heard a tuning fork quite often thirty, thirty-two and thirty-five seconds. Possibly, like one of the doctors mentioned, I have an acute hearing. That might enter as a factor in the examination—the hearing of the examiner. Also the tuning fork will enter into consideration. These things must be considered in arriving at a definite conclusion as to the condition. As to finding the lower limit of the middle cerebral fossa, I think we might be misled very frequently. As mentioned by Dr. Ballenger, the land-mark overlaps the external auditory meatus and might not give us any definite and positive in dication.

Dr. Beck: The case referred to by Dr. Andrews was one of acute otitis media on both sides. The partial examinations I made were very unsatisfactory with the method Dr. Andrews described. I made two examinations, the last on the side where the mastoid became affected. The time was, I believe, thirty-five seconds; on the other, twenty seconds. The patient was operated on and I was not at all surprised that we found just what was expected, as described by Dr. Andrews. The patient got well and I was more surprised on examining the well ear that she had no signs of mastoiditis in making the careful examination by this method, and heard the sound more intense than when we examined in his office, and the time was fully thirty or thirty-two seconds. I am not able to explain that. She had no bulging of the drum membrane, although she had an acute otitis in that ear. Perhaps the increased density of the structure may explain it. As far as originality is concerned, I never heard of the method until very recently. I spoke to a man who had studied in Vienna and he said he saw the method demonstrated at Urbantschitsch's clinic last year. I was there but did not see it. There was a question as to whether it had been tried on the antrum of Highmore. It has been tried in the clinic of Jacobson, Berlin, to find dullness on percussion on the affected side, but owing to the painfulness of this procedure the method was unsatisfactory.

Dr. Brown: I did not hear all of the paper, but this a subject in which one is much interested as one of the means of aid in a knowledge of diseases of the mastoid. I would be glad if the doctor would tell us a little more of the tuning forks and his method of using them. Dr. Pierce and I were making our first attempt and the fork was heard longer in the well ear than the affected, but I am satisfied we struck it with more force for this ear. Means must certainly be provided for uniform force in the blow that sets the fork in vibra-

tion. It seems that good, scientific grounds exist for this test to rest on. We have a certain medium to act as a sounding board, and any change in the density and thickness of the medium will affect the duration of the sound as heard by the examiner. At the same time we must admit that the action of the mastoid as a sounding board may vary from anatomical peculiarities as well as from pathological changes.

DR. GOLDSTEIN: I think the method which Dr. Beck refers to, of determining the condition of the mastoid, as used by Urbartschitsch, is the one which is used in connection with transillumination. The focus of light is seen to a certain extent in the dark room through the middle ear in case the walls are normal and membrana tympana translucent. In case of accumulation of pus the illumination is much less marked and shows a difference by comparison with the healthy side. The question has been raised as to the possibility of using the diagnostic feature of the tuning-fork in other sinuses. Dr. Kuyk, of Richmond, Va., published in a recent issue of THE LARYNGOSCOPE a notice of his research in this line and claims similar results in diagnosing the maxillary sinus.

DR. PIERCE: This is an important matter, inasmuch as it brings into play physical laws which are not subject to change or individual idiosyncracy, and if it can be applied to the diagnosis of antrum or mastoid diseases, it must be of great importance. The method in various forms has occurred to a number of investigators. As far back as nine years ago Körner made some investigations with negative results. As Dr. Brown has just said, we all hear the tuning fork much longer than the doctor reports having heard it in his case. I heard it fifty-three seconds; the doctor fifty odd seconds, and a couple of others heard it even longer than we did. The duration of sound depends largely on the force of the stroke given the tuning fork. Again, the sound waves set up by the fork penetrate the mastoid region, are carried through the brain mass, in the same way as the sound waves are carried out from the vertex through the auditory canal into the outer world, say in Weber's test. If my reasoning is right the phenomenon of shortening is due to the reflection and not absorption of sound waves by the fluid in the ear. I have had no experience with the method, but shall turn my attention to it immediately.

DR. ANDREWS, closing discussion: I shall not attempt to answer these questions in the order in which they were given, but let me say in response to our president's statement, that Dr. Kuyk's examination is a subjective test and not objective. He depends

upon transmission of sound waves to the patient's ear and not to his own, which makes it an entirely different test. If Dr. Pierce had heard the paper some of the statements which he has made would probably not have been made. The fork he was using for making these tests is not the fork I use. The fork which Dr. Pierce used can be heard by the normal ear over two minutes. The fork I have used can be heard about thirty-five seconds. So it is not strange that he heard the fork longer than the time I mentioned. I am very glad to learn that other work has been done along this line. I have asked quite a number of my friends about their experience. A number have wondered why they had not thought of it before. I am glad some one else has. The case Dr. Stein mentions is one in which the use of this test was not indicated, because everything else pointed toward destruction of the mastoid. Dr. Stucky asks about the aid in operating. If it aids us in locating the lateral sinus it may help us to keep out of trouble. I have used it in the examination of the frontal sinus, but have no report to make. It is not necessary to exclude the sound waves that are absorbed by the tube. If you will place the stethoscope on the palm of the hand and then go over the tips of the fingers with the vibrating fork, the moment you get the fork on the finger over which the bell is resting you will find a marked increase. The sound is conducted through the bone. I have used it with general surgeons in diagnosing fractures, for instance, of the femur. When the tuning fork is on the knee and the stethoscope is on the head of the femur or the crest of the ilium the sound will be more distinctly heard on the normal side than on the opposite side if the bone is broken.

Therapeutic Value of Adrenalin. By Dr. Dudley S. Reynolds (Louisville, Ky.)

DISCUSSION.

Dr. Dayton: I will say that so far as this solution is concerned, I am not familiar with it. I have used the dry extract in my experiments begun almost three years ago, and I was astonished when he spoke of his 1 to 1,000 and 1 to 10,000 solution, inasmuch as I used five and ten per cent solution of dry extract. I found its hemostatic and bleaching properties were marked in the eye and I tried it first for foreign bodies and then again for acute conjunctival diseases. I found that while there was no question of its bleaching qualities, it did not act beneficially in hastening the curing of acute conjunctival diseases. In operations I found it a benefit, in prevent-

ing hemorrhages in operations upon the conjunctiva. The doctor speaks of the benefits of adrenalin, but he is not explicit enough as to whether he has used cocaine with it or not. He speaks of operating on the conjunctiva without pain, etc. Is it the purpose of the essayist to allow us to judge, that that alone was the anesthetic, as well as the hemostatic, or did he combine the two? I may not have got the meaning clear, but I did not understand that he used an anesthetic other than the adrenalin. I can understand how it would act in dacryo-cystitis with swelling, especially in the acute form. So far as the use of the dry extract is concerned, would say that it has proven itself a very beneficial and important drug to add to our armamentarium.

DR. STEIN: I can see the great advantage in the use of adrenalin over that of the extract in eye work; and in nose and throat work I have recently had occasion to use it in acute cases like coryza. etc. I have had acute coryza in my family and I have tried it. Adrenalin in a solution of 1 to 1,000 is probably better than the ten per cent solution of the extract, but the expense is in the way. It is sold for $1.00 a grain, which stands a little in the way of its popularity. As to the difficulty of preserving the adrenal extract solution, that is not so great as you imagine. I do not have trouble. The phecene Dr. Beck mentions I have used; in fact, I believe I was the first to use it as a preservative in adrenal solution. It will keep indefinitely. I have samples a year and a half old.

DR. BECK: I have used the adrenalin about two months. Previous to that I used the supra-renal capsule, and I found the great difficulty with that preparation was that it became contaminated, mouldy, although I did not get a large supply at a time, and that has been the general objection, and it has been supplanted by adrenalin. I have used it in the eye and nose, both with satisfaction. There is a question about the keeping of this, and it came up in a meeting we had last week, that if the papers are removed and the bottles left exposed to the light, in about a week or ten days they become a light, pinkish color, the color of eserin, which signifies that it is not good any more. The substance I have used for preventing the spoiling of the supra-renal capsule goes by the name of phecine.

DR. GOLDSTEIN: I wish to give my unqualified endorsement of adrenalin. I think it is undoubtedly the most valuable therapeutic agent we have yet added since the advent of cocaine. In many ways it is the superior of cocaine. Its value as an agent to contract mucous membrane is far superior to cocaine, and it has not the disadvantage of causing any untoward symptoms of the nervous system.

The tissues of the nose, where I have used it most extensively, are blanched almost as soon as the application is made, and the contraction of the tissues soon follows. When the desiccated supra-renal capsule is applied directly to the nasal mucous membrane it always acts more or less as an irritant. I received the first sample of the adrenalin preparation about December 20th last. I am sure we will get results that we are unable to get with any other form of supra-renal.

Some two months ago I was called to see a case of œdema of the glottis following in the course of an acute nephritis. The use of adrenalin was followed by prompt relief. Other circumstances, I believe, surgical interference would have been necessary.

I have noticed that the after effect remains from two to three hours. Dr. Stein's successful use of it in acute coryza I can indorse. I have seen cases practically cured with one application.

A suggestion which has been of value to me, is that in operating on the middle ear, while the patient is being prepared and put on the table and the instruments are being sterilized the adrenalin solution (1 to 1,000) is dropped in the ear, and the resulting operation is a bloodless one.

Dr. Dodd: I have used adrenalin for some little time, and I had a case the other day which illustrated its value in eye operations. I have used it in nose work as well, and have found it much superior to the old form of extract of supra-renal. The case I speak of was inflammatory glaucoma, and it would have been impossible to operate unless I had used something of the kind. It would have necessitated a general anesthetic and the woman was in no condition to take it. I only used one to 10,000 of the chloride of adrenalin. It became perfectly anesthetic with the cocaine, and lasted so that I did the operation without trouble or pain.

Dr. B. Tauber (Cincinnati): I had some experience with suprarenal, and lately have commenced to use the adrenalin. I will report my results later on.

To preserve the suprarenal solution, I add to each ounce one grain of salicylic acid, which will keep the solution clear for an indefinite time.

Dr. Dudley S. Reynolds (closing): I am deeply grateful for the interest shown by the members. I would explain that I received from Parke, Davis & Co. a half dozen bottles of various solutions of the chloride of adrenalin in December, 1900, and I experimented with it in an irregular way until the 14th of January, 1901, when I began, with the assistance of Dr. Bullington, to use it in every case where it could be experimented with to advantage. It is the results

of these experiments that I have recited to you. In regard to keeping the solution, I find it will change color if left in an open bottle in a strong light. If carelessly left to the use of assistants at the clinic, employing the ordinary dropping glass, it will begin to spoil in about eight days. I have a solution of 1 to 1,000 in normal salt solution, which I have kept in the dark, which has undergone the change of color—first a little straw color, and then darker until it is now quite brown, and it is just as active and efficient at the present time as when it was fresh. It is exceedingly sensitive to light, but if you will keep it in a cabinet which is kept closed, returning the bottle immediately after taking it out for use, and keeping your dropping glass in a sterile cover, with all necessary aseptic conditions, the adrenalin solution is practically permanent. The highly-colored solution I have now has been open since the 15th of January, and, while changed in color, it is perfectly free from decomposition.

As to the value of it in surgery, I have used it in a great variety of operations, and I find it promptly efficient. I regard it indispensable in doing iridectomy in cases of glaucoma. When employed in operations on the eye, it is desirable to first apply the adrenalin, wait one minute, then apply the cocaine solution, and, after the lapse of two minutes more, you apply another drop of the adrenalin. You need but one drop of the cocaine solution and two applications of the adrenalin. The effect will last for a time far exceeding that required for any of the operations, and no hemorrhage at all will occur in the majority of cases, especially if you hold the lids apart for a few seconds after each application to allow the blood to leave the surface before operating.

The duration of full cocaine anesthesia is about twelve minutes. If you have previously applied the adrenalin solution, and two or three minutes afterward the cocaine, you will find anesthesia remains as long as the vessels remain contracted. It may be an hour or two, and it will almost always be more than twenty minutes, even in glaucoma.

All blood clots, and all inflammatory matters, must be removed, so as to allow the adrenalin solution to come into direct contact with the membrane whenever the hemostatic action is desired. The best way to apply it in cases of hemorrhage is by saturating cotton wool with the solution and apply the cotton with gentle but firm pressure. Spraying may do in mild epistaxis, but not in secondary hemorrhage after operations.

Atrophic Laryngitis. Dr. B. Tauber, Cincinnati.

This paper was published in full in The Laryngoscope, June, 1901, p. 426.

DISCUSSION.

Dr. Holinger: I was very interested in this paper for one reason. This condition, especially dry laryngitis is very often found in connection with ozena or atrophic conditions of the nose. The point the doctor makes is well taken and I am sure it deserves much consideration, that in this case there is just the opposite condition, a hypertrophic condition in the nasal passages combined with an atrophy in the larynx. There are two points I would like to hear about: the condition of the epithelium in the nose, and the condition of the epithelium in the larynx? If you succeed in pinching out a little portion of the epithelium in the larynx does it appear to be very dry? If one could get one or two nice slides they would contribute a good deal to the knowledge of these conditions, because, as I say, the combination of hypertrophy in the nose and atrophy in the larynx is exceedingly rare.

Dr. J. O. Stillson (Indianapolis): I have seen cases where I was satisfied that the hypertrophic rhinitis was followed by the atrophic, but have never seen the same individual suffering from the two at the same time.

Dr. Garlick: I would like to ask the essayist if his cases were "mouth breathers." As he states his case had hypertrophic rhinitis and slight as the changes in the membrane may be one finds obstruction to nasal breathing and the inhaled air not properly warmed or cleansed. This as an irritant causes formation of crusts in the larynx and loss of superficial epithelium rather than a true atrophy of the membrane.

Dr. B. Tauber (closing discussion): I have treated about 100 cases of atrophic rhinitis and pharyngitis which were present in the anterior nares, passing downwards into the posterior nares and lower pharynx; also observed several cases of slight atrophic laryngitis in the subglottic region of the larynx. My patient was in good health, had no diathesis, she had an "unique" atrophy of the larynx and could breathe through her nose and posterior nasal space; the mucous membrane of the anterior and posterior nares were in a hypertrophic condition.

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It is our purpose to furnish in this Department a complete and reliable record of the world's current literature of Rhinology, Laryngology and Otology.

All papers marked (*) will be published in abstract in THE LARYNGOSCOPE.

Authors noting an omission of their papers will confer a favor by informing the Editor.

I. NOSE AND NASO-PHARYNX.

Absence of the Right External Nasal Meatus. *Otchot o dieyateln. Khirurg. Klin., etc. v. Mosk.* (1899-1900), 1901, p. 16.

Deformity of the Nose; Two Cases. *Otchot o dieyathln. Khirurg. Klin., etc., v. Mosk.* (1899-1900), 1901, pp. 74-77.

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SELECTED ABSTRACTS.

Edited by
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with the collaboration of the
EDITORIAL STAFF.

The Correction of the Deviations of the Nasal Septum. Etc.—JOHN O. ROE (Rochester)—*N. Y. Med. Journ.*, April 13, 1901.

This interesting paper is illustrated in a practical manner, which materially assists the reader to appreciate the author's statements. Attention is directed to special instruments for the operation under consideration. The method suggested is based upon the principles of force being applied to one side of the septum, indenting it between two opposing points of resistence placed on the opposite side.

The steps of the technique are described diagrammatically through the article. Good results are claimed for this operation, together with a number of advantages over other methods.

M. D. LEDERMAN.

Note on the Treatment of Collapse of the Ala Nasi—W. J. WALSHAM—*The Lancet*, March 30, 1901.

Collapse of the ala nasi consists in the falling of the external part of the lower lateral cartilage inwards during inspiration. Normally, the lower lower lateral cartilage is doubled on itself, U-like, the inner part being in contact with the lower end of the septum, whilst the external forms a part of the outer wall of the vestibule. There is an amount of stiffness in the cartilage which keeps the anterior nares patent and the resiliency of the cartilage where the bend occurs is sufficient, after the two portions of the cartilage have been pressed together, to restore the patency of the anterior nares. In not a few individuals this resiliency is lost. In some of these cases there co-exists a dislocation of the anterior end of the septum from the columella, and this, when present, increases the obstruction to free inspiration.

This collapse of the ala may easily be overlooked by the surgeon unless he is cognizant that such a condition may occur. For when the speculum is introduced and the blades are separated, the collapsed ala at the same time is, of course, carried away from the septum by the external blade of the speculum, and nothing whatever may be discovered on looking into the nasal cavities to account for the patient's trouble. If, now, the speculum is removed and the vestibule is examined by tilting up the tip of the nose with the

finger, it will be seen that the outer wall comes in contact with the inner when the patient inspires.

The condition is an exceedingly troublesome one to treat. The author has seen some good done by face massage—that is, massage of the dilator muscles of the ala—but not much. When there is dislocation of the of the anterior end of the septum, shaving off the projecting portion will also help matters, though it will not completely rid the patient of his trouble. The various rings, semicircles, celluloid expanders, short pieces of drainage-tube, etc., that have been from time to time recommended for the condition, although they may keep the passage expanded whilst *in situ*, and for the time give relief, soon become irksome and irritable and are abandoned. In one case a number of similar contrivances of various material were carefully moulded aad shaped to fit the part accurately. But this patient, like the rest, finally threw them aside and resorted again to his own plan of obtaining relief, namely, rolling up a piece of moist cotton-wool into a ball of the size of a small pea, which he poked up the vestibule into the little pit just within the limen at the angle of bending of the lower lateral cartilage. This tiny ball of cotton-wool was just sufficient to prevent the ala from collapsing, and it gave the author the clew to the method of curing the condition. It struck him that, if in place of the cotton-wool ball, he could transplant there a ball of the patient's own tissue, he should obtain the same end, and this he succeeded in doing in the following way: A strip of mucous membrane, as thick as possible, and about $^{3}/_{16}$ inch in width, was dissected up from the inner wall of the vestibule, leaving the base attached above. The surface of the little pit at the angle of bending of the lower lateral cartilage was next made raw by removing the epithelial layer. The epithelial lining was also removed from the little strip of tissue; the tissue itself was rolled up bandage-wise, and then secured to the rawed surface of the pit by a stitch of the finest fishing-gut passed by a needle through the septum into the opposite nostril and back again. When thus fixed the little roll of tissue pressed out the external portion of the lateral cartilage just enough to prevent the ala during inspiration from falling into contact with the septum. It cannot be seen, and produces no deformity, and so far as his experience has gone it is a permanent cure for this troublesome condition. The surface left by rolling up the strip of mucous membrane readily granulates over and causes no inconvenience. Tension in the strip of tissue must, of course, be avoided, and care must be taken that the surfaces of the roll are properly and completely bared, and their vascular supply not interfered with by drawing the stitch too tight. The operation is best done under general anesthesia, as unless the tissues are manipulated delicately the blood supply of the little strip will be injured and necrosis will take place. StClair Thomson.

On the Causation and Treatment of Profuse Epistaxis in People Beyond Middle Age—GEORGE COATES—*The Lancet*, April 20, 1901.

The author had a series of five cases of profuse epistaxis not caused by a blow or injury, but coming on without any apparent cause in adults aged fifty years and upwards, all of whom he had known and watched for several years both before and after the attack, and in whom he had been able to trace the series of events which caused and followed it. The attacks have been sudden in their onset, and profuse, generally lasting from half an hour to an hour or more, and tending to recur for several days. The cases are briefly as follows:

Case 1.—The patient was a gouty man. He had had a severe attack of epistaxis seventeen years ago, which was finally stopped by plugging the posterior nares in the usual manner. At the same time he developed cardiac disease, *i. e.*, well-marked mitral regurgitation. He died fifteen years later, aged eighty-two years, from bronchitis and pneumonia. There was some chronic nephritis.

Case 2.—The patent was a woman aged fifty-two years. She had had profuse epistaxis seven years ago, which also was finally stopped by plugging the posterior nares. She developed mitral regurgitation at the same time. She is now alive and well.

Case 3.—The patient was a man aged sixty-eight years. He had epistaxis four years ago. He developed aortic regurgitation at the same time. He was treated with blue pill and a mixture of sulphate of quinine and sulphate of magnesia and rest in bed. Plugging was not necessary.

Case 4.—The patient in this case was a woman, aged sixty-four years, who had suffered for at least ten years from high arterial tension.

Case 5.—The patient was a woman, aged sixty-eight years, who had suffered for several years from high arterial tension, due to arterio-capillary fibrosis and from contracted granular kidney.

With the exception of the patient in Case 1, all the others are now alive. In Case 4 and Case 5, the patients did not develop any valvular lesion. The epistaxis in both of these followed exposure to cold when they were very tired; they both had over-exerted themselves for many days, and then got thoroughly chilled. In both the epistaxis was cured by administering nitro-glycerine and tincture of strophanthus.

In all these cases the sequence of events which led up to the epistaxis was essentially the same, namely:

(a) Long-continued high arterial pressure. *(b)* Some sudden cardiac failure. In Cases 1, 2 and 3 the epistaxis arose from the giving way of a valve. In Case 4 and Case 5 it arose from loss of power of the cardiac wall. *(c)* Over-filling of the whole venous system, the weakened heart not being able sufficiently to empty the engorged veins against the high pressure in the arterial system due to contracted arterioles. *(d)* Leakage from an over-filled vein. In Cases 1, 2 and 3, in which the patients all had a good amount of

muscular strength and vigor, the heart had gone on working against this high pressure until a valve, aortic or mitral, gave way. In Case 4 and Case 5 there was not enough vigor of constitution in the patients for the heart to be sufficiently strong to raise the arterial pressure high enough to cause valvular leakage. In them, however, the same state of venous engorgement was produced in the following manner. They had both over-exerted themselves, and felt very tired for some days, then, when exposure to cold constricted their superficial vessels, such a sudden increase of work was thrown on the heart that the tired muscle was no longer able to do its work efficiently. Here again the veins became over-filled and epistaxis occurred. Both these last cases were caused by the same spell of cold weather, and various remedies, as suggested in the various text-books, were tried with little result. When seeing the patient in Case 4 the thought occurred, Why not try to relax the arteries and strengthen the heart so as to get the veins emptied naturally?

The most scientific and satisfactory treatment of these cases of epistaxis, and by analogy of the other forms of passive venous hemorrhage, is to empty the over-filled veins. As long as they are enormously distended with blood the hemorrhage must continue, unless direct mechanical means are used, and if one nostril be plugged the epistaxis is apt to start from the other. If, on the contrary, we can relax the walls of the arteries and help the enfeebled heart to do its work, it will soon empty the over-filled veins. But, as a rule, this cannot be done by giving heart tonics at first. The heart has been doing its utmost; it has only failed because it has been overworked, and giving a tonic is like spurriug a jaded horse. We must bear in mind that in this class of cases the immediate treatment must be directed to the capillaries and small arteries, as the real cause of the epistaxis lies there, not in the nose. Nitro-glycerine is quite effective; nitrite of amyl might be more so, but one of the more quickly acting nitrites should be used at first; afterwards one of the more slowly acting, as erythrol tetranitrite, or possibly even thyroid tabloids, might do as well. When the capillaries and arterioles are dilated and pervious, then comes the time for strychnine or strophanthus. Of course, each patient must be considered individually, and there are other ways of keeping down excessive blood-pressure and strengthening a weak heart. In spite of everything, plugging may have to be resorted to in some cases, but in most of them the hemorrhage can be stopped without resorting to this procedure, which is always most uncomfortable to the patient and sometimes even dangerous.

Finally, by recognizing profuse epistaxis as a symptom of a sudden though mostly temporary heart-failure, there is no danger of commencing valvular disease being overlooked and the patient being considered as one who only requires a little surgical treatment. In some cases it is possible that the alteration in the circulation causing the epistaxis may also cause cerebral symptoms, but here again the cerebral symptoms are mostly not the cause or the result of the epistaxis, but only the result of the circulatory condition leading to the epistaxis. StClair Thomson.

Sclerotic Hyperplasia of the Pharynx and Naso-Pharynx—A. Brown Kelly—*The Lancet*, April 6. 1901.

The author believes the condition to be a hitherto undescribed pathological entity. The patient was a male, aged thirty-four, who had been subject to slight sore throat for about eight years, and for three years had felt some thickening in his throat. The case presented three striking features, namely, greatly enlarged uvula, a thick band descending in each half of the posterior wall of the pharynx, and thickening of the roof and floor of the naso-pharynx leading to a marked diminution of its lumen. In all the regions affected the morbid process is apparently the same, consisting in diffuse uniform thickening, which histologically proves to be a marked interstitial hyperplasia. The development of the disease has been very slow, and is probably still proceeding. In endeavoring to diagnose this condition several diseases have come under consideration.

1. *Rhinoscleroma.*—In this disease the naso-pharynx is the region most frequently involved, and its aspect may come to resemble that presented by my patient. In rhinoscleroma, however, the reduction in the lumen of the naso-pharynx is due to cicatricial contraction, and not, as here, to thickening of the tissues. Further, no description corresponding with the appearances of the uvula or posterior wall of the pharynx in this case could be found. The fact, also, that rhinoscleroma has been observed in this country only in persons who have come from districts in which the disease is endemic renders it highly improbable that my patient's ailment is of this nature. Lastly, the absence of the specific bacillus and of Mikulicz's cells almost conclusively disproves rhinoscleroma.

2. *Tertiary Syphilis*, owing to the various aspects it may assume in the throat, naturally suggests itself. Inquiry as to the patient's previous health yields no indication of his ever having contracted venereal disease; besides, this morbid process differs from tertiary syphilis in its perfect symmetry, in the absence of any tendency to ulceretion, and in its being uninfluenced by iodide of potassium.

3. *Hereditary Syphilis.*—Owing to the want of corroborative evidence in the personal and family history of the patient, and because of the general dissimilarity of his pharyngeal manifestations to those observed in hereditary syphilis, the author believes that this disease may be left out of account as an etiological factor.

While unable to find a disease of which the sclerotic hyperplasia in the man is a manifestation, an analogous condition probably exists in subglottic hypertrophic laryngitis. This affection is usually characterized by the presence of pinkish, smooth, firm, symmetrical folds beneath the vocal cords, which develop slowly, apparently in consequence of recurrent inflammatory attacks, during which they become more or less swollen. If we now turn to the case under discussion we find folds of thickened tissue in the pharynx presenting characters similar to those just mentioned; we get a clinical history of his having been subject to sore-throat for years, and of permanent symptoms due to hypertrophic changes having set in only at a comparrtixely recent date; examination during an inflam-

matory attack revealed marked swelling of part of the affected region; and, lastly, A. Sokolowski's* account—which is probably the most detailed and thorough—of the histology of subglottic hypertrophic laryngitis might stand for that of the removed portion of the enlarged uvula, the sole difference being that in our case the deeper layer of the epithelium is not thrown into papille, but presents practically an even continuous surface, the columnar character of the deepest cells of the rete Malpighii, however, being maintained.

Considerable discussion has taken place as to the nature of subglottic hypertrophic laryngitis. In most text-books the causes mentioned are tuberculosis, syphilis and rhinoscleroma, the last being probably the commonest. Of 100 cases of scleroma recently reported by A. Baurowicz† thirty-four were affected with subglottic hypertrophic laryngitis. If the frequency of subglottic hypertrophic laryngitis in scleroma be coupled with its great rarity apart from this disease, it can be understood how certain observers who live where rhinoscleroma is prevalent—*e. g.*, P. Pieniazek‡ and Baurowicz, of Cracow—and who consequently see subglottic hypertrophic laryngitis comparatively often, maintain that it is *always* a manifestation of scleroma. On the other hand, Sokolowski, of Warsaw, who has also had an extensive experience of rhinoscleroma, denies this, and proves, incontestably, as it seems to the author, that subglottic hypertrophic laryngitis may develop independently of scleroma, tuberculosis and syphilis; he thinks that the morbid process is of a specific nature, the etiological factor being as yet unknown, but he suggests that hereditary syphilis may play a part. A. Kuttner§ reports a case of subglottic hypertrophic laryngitis in which there were no grounds for suspecting the presence of any of the infective diseases mentioned; he maintains, therefore, that this laryngeal condition may appear as an affection *sui generis* which he proposes to term the genuine form of chorditis vocalis inferior hypertrophica. F. H. Bosworth‖ also states that there can be no question of a simple idiopathic inflammatory process in the subglottic region giving rise to marked hypertrophy, but he thinks that in most instances a diathetic condition is present. There are thus good reasons for according to subglottic hypertrophic laryngitis independent rank amongst the diseases of the larynx.

The facts brought forward in this paper, if correctly interpreted, prove (1) that the pharynx and naso-pharynx may be the seat of a sclerotic hyperplasia unconnected with syphilis, rhinoscleroma or other known infective disease; (2) that a similar morbid process may manifest itself beneath the vocal cords as subglottic hypertrophic laryngitis, and (3) that in the hyperplastic variety of hereditary syphilis the histological appearance closely resemble those of the above-described sclerotic hyperplasia. StClair Thomson.

* "Ein Beitrag zur Pathologie und Therapie der Chronischen Hypertrophischen Kehlkopfentzundung," *Archiv fur Laryngologie*, Band ii, S. 68; also Band iv, S. 239.

† "Das Sklerom auf Grund der Beobachtung von 100 Fallen," *Archiv fur Laryngologie*, Band x, S. 396; "Zur Aetiologie der Sogenannten Chorditis Vocalis Inferior Hypertrophica," *Ibid.*, Band vii, S. 340.

‡ Heymann's "Handbuch der Laryngologie," Band i, 1305

§ "Chorditis Vocalis Inferior Hypertrophica," *Archiv fur Laryngologie*, Band v, S. 275.

‖ "A Treatise on Diseases of the Nose and Throat," vol. ii, p. 529.

The Treatment of Nasal Polypus—LAMBERT LACK—*Journal of Laryngology*, February, 1901.

Our attention should be directed towards eradicating the bone disease. The patient should be anesthetized, and the ethmoidal region should be examined by the finger, both through the nose and also through the post-nasal space, to determine the extent of the disease. If the middle turbinate be present it may be removed and any large polypi with it. The lateral mass of the ethmoid should be thoroughly scraped away by means of a large ring-knife, such as Meyer's original adenoid curette. The finger is introduced from time to time to observe the progress, and the scraping is continued until all friable tissue has been removed. "Great caution must be used when the region of the cribreform plate is reached, but the whole inner wall of the orbit may be scraped away with impunity." The operation should be performed with the patient turned well over on his side, and in cases where the posterior part of the ethmoid is unaffected a large sponge may be pushed up into the post-nasal space. After the operation the bleeding is checked by packing the nose with a strip of gauze soaked in a glycerine iodoform emulsion. The gauze should be changed every second or third day and the nose irrigated. M. D. LEDERMAN.

On the Use and Abuse of Nasal Sprays—DUNBAR ROY (Atlanta, Ga.)—*St. Louis Courier of Med.*, June, 1901.

According to the author the abuse of sprays consists in: 1. The medicinal substance used. 2. The frequency of its use. 3. The force of the spray.

Nasal sprays have no place for cleansing purposes in acute inflammations, but find their chief benefits in chronic conditions where there is an abundant mucus or muco-purulent discharge. The only solution, according to the author, which will accomplish proper cleansing, is one which is watery and alkaline in character. In his experience, oily sprays have absolutely no place in nasal therapeusis for cleansing pure and simple.

Sprays used for their stimulating qualities can be either watery or oily.

He has found a benzoinated oily menstrum, or one with a few drops of terebene in it, is by far the best.

A second abuse of sprays is the frequency of their use, which the author considers a great and growing evil among rhinologists. He holds the popular use of late of the menthol oily spray largely responsible for this error, and maintains that there exists a "spray habit" just as we find that of cocaine and morphine. He thinks that, though a valuable nasal therapeutic remedy, the harm done by menthol far outweighs the good.

The third abuse of the spray is its force. The author considers a compression of fifteen pounds a sufficient one. [This is about double the force many rhinologists have found advisable in the nasal fossæ. In the pharynx and naso-pharynx a greater one is often tolerated.—Ed.] EATON.

Some Anomalies of the Ear Due to Errors in Development—Geo. C. Stout (Philadelphia)—*Journ. of the Am. Med. Assn.*, April 20, 1901.

The author reports a series of interesting anomalies of the auricle, and by courtesy of the *Journ. of the Am. Med. Assn.* we reproduce the illustrations accompanying the paper.

Figure 1 pictures the auricle of a boy of sixteen years without other defection in his development. The little nodule anterior to the tragus was probably formed by an auxiliary nodule on the

Figure 1.

mandibular arch. It is apparently composed of cartilage, fibrous tissue and skin, and could be removed without any unpleasant sequelæ.

Figure 2 is taken from a drawing from the ear of an Italian woman of otherwise normal development and in whose immediate

Figure 2.

ancestors no physical defects were noted. In this case four nodules are seen. _____

Figure 3.

Figure 3 is a case from the practice of Dr. B. A. Randall, due to failure of coalescence of the tubercles.

Figure 4, originally presented in the London *Lancet*, shows what was probably an auxiliary set of tubercles—about second cleft.

Figure 5 is taken from a new-born infant, which had no external nose; it had no eyes except a rudimentary one in the center of the

Figure 4.

forehead from which a horn projected. Other defects were present. In this case the tubercles also failed to develop.

Figure 5.

Figure 6 is taken from an infant that lived ten days in which there were many other defects. It had hypospadias and a very

small but well-formed scrotum, and there existed a deformity like an auxiliary anus just at the point of sacrum. It had cleft palate, embryonic nose, large fontanelles, etc. In this case there was

Figure 6.

arrested development of tubercles. There was an auxiliary meatus due to failure of closure of walls of the hyo-mandibular cleft.

Rapid Growth of Aural Exostosis—W. R. H. STEWART, (Edinburgh).—*British Med. Journ.*, June 1, 1901.

The author reports case of a lady of middle age who had had a small exostosis in each meatus for some years. After a recent attack of influenza, accompanied by a good deal of pain in the ears, the exostosis in the left ear began to grow rapidly and extended right across the meatus touching the opposite wall.

F. W. FOXCROFT.

Emphysema of the Eyelid from Nasal Causes—BEAMAN DOUGLASS —*N. Y. Med. Journ.*, March 23, 1901.

A number of cases are reported in which the condition followed forcible blowing of the nose. An emphysema of the upper lid occurring as a wound accident, must arise from a direct perforation of the lamina papyracea of the ethmoid bone, which also forms part of the orbital wall.

During ethmoid operations the instrument fractures part of the orbital wall, and wounds and tears the mucous membrane lining the ethmoid cells. This allows a direct communication of air between the nose and orbit.

The author suggests to avoid the use of the curette in these operations as much as possible, as it is this instrument which is responsible for much of the traumatism at this particular site. The biting forceps is the better instrument to employ. Another rule to follow, is never to amputate any part of the middle turbinal, as it forms an important guide. The operation should be carried out along the outside of the turbinal, and if the bone itself is to be removed, it can be done later.

M. D. LEDERMAN.

A Case of Severe Mastoid Neuralgia—JOHN DUNN, (Richmond, Va.)—*The Virginia Medical Semi-Monthly*, April 12, 1901.

Severe neuralgia of the mastoid is met with from time to time; it may be reflex or strictly local in character; it may exist either with or without other visible concomitant conditions to suggest its cause; generally, there is a history of a more or less remote, acute—be it purulent or catarrhal—inflammation of the middle ear and its annexed antrum, the neuralgia appearing afterwards when the patient takes cold; it sometimes complicates simple abscess of the attic or acute empyema of the mastoid antrum and forces the surgeon to explore the mastoid, although in similar cases, without this neuralgia, he is satisfied with opening Schrapnell's membrane; it is in many, if not most, instances, uncontrollable by other than surgical means, which consist in all save the cases with a reflex origin for the neuralgia in opening the mastoid process, to which it readily yields in nearly all cases. In some cases, after persisting for weeks, the severity gradually subsides; the neuralgia has, however, a tendency to recur each time the patient is exposed to or takes cold. We have no way at present to accurately foretell in what condition we shall find the contents of the mastoid process in these cases. It is well to remove the cortex over an area one-third to half an inch wide, extending from the region of the fossa to the tip before mutilating the cells that we may in each case examine them carefully. The external incisions, unless we find contra-indications, should be closed by sutures at the time of the operation.

W. SCHEPPEGRELL.

Infective Sigmoid Sinus Thrombosis—C. R. DUFOUR (Washington, D. C.)—*N. Y. Med. Journ.*, March 23, 1901.

The most common cause is through an infective inflammation from the middle ear, producing a thrombosis of the small veins leading into the sigmoid sinus, or by direct erosion of bone.

Among the symptoms which point to involvement of the sinus in suppurative disease of the middle ear are persistent hemicrania, fever, rigors, nausea and vomiting. The temperature is of a fluctuating character, with copious sweating and anxious appearance of the face. The rigors or chills appear early. These indications, however, may not be present at all. The fluctuating temperature is an important and significant symptom. Edema of the occipital region caused by an obstruction of the occipital and mastoid veins, and by a phlebitis of the vessels (Griesinger's symptom) is characteristic of the disease. When thrombosed the jugular vein may be felt as a cord in the neck to the inner side of the sterno-mastoid muscle. The most serious stage of the disease is that of disintegration and breaking down of the thrombus, as it exposes the patient to pulmonary infractions and metastasis elsewhere.

The treatment in such cases is to expose the sinus, remove the thrombus, and, if same extends to the jugular vein, the latter must be ligatured and removed, if diseased, together with its tributaries.

M. D. LEDERMAN.

Lateral Sinus Pyemia and Cerebellar Abscess with Cheyne-Stokes Respiration; Recovery—H. F. WATERHOUSE—*The Lancet*, March 30, 1901.

The patient was a dental surgeon admitted into Charing Cross Hospital on April 17, 1899, with lateral sinus pyemia. He had been for many years a sufferer from chronic tuberculous abscesses in the rigion of the right hip, and had had a purulent discharge from both ears for the greater part of his life. In 1895 Mr. Waterhouse had operated upon him for a large supramostoid abscess on the right side, and shortly prior to admission Dr. Green had opened two abscesses of the right hip. On April 11th the patient felt ill; the temperature was 100° F., and the pulse was 100. On April 12th he had a rigor in a train. On April 13th he had a rigor of half an hour's duration and a temperature of 103°. On April 15th Mr. A. M. Shield saw the patient and diagnosed lateral sinus septic thrombosis, but was unable to decide upon which side the condition was. On admission to Charing Cross Hospital the patient's temperature was 104.2°, the pulse was 100, and the heart and lungs were normal. There were no pupillary changes and no optic neuritis. From this time to April 28th the patient had repeated rigors, the highest temperature was 105.2°, and a systolic heart murmur developed after continuous pain over the base of the heart whilst he was in the hospital. Cough was noticed a few days later, and the sputa was of prune-juice color. His condition became profoundly toxemic and apparently hopeless. Much valuable time was of necessity lost in waiting in the hope of determining upon which side the sinus was affected. At last, on April 28th, when it became clear that the time for operative interference with any hope of success was rapidly passing away, Mr. Waterhouse operated upon the left lateral sinus and internal jugular vein, dividing the latter between two ligatures and incising and clearing out the septic thrombus in the former. Recovery took place; nevertheless, on May 1st, Dr. J. W. H. Eyre, bacteriologist to the hospital, found streptococci in the blood. Everything went well until June 7th, when the patient was allowed to get out of bed. On June 8th complaint was made of headache, vomiting occurred, and the pulse fell to 56. Drowsiness increased, until on the evening of June 10th the patient was comatose, and there were double optic neuritis, Cheyne-Stokes respiration, and a pulse of only 50. It was then decided to explore the temporo-sphenoidal lobe and the cerebellar fossa on the left side. Unfortunately, the former was first attempted, with negative result. Respiration ceased entirely under even partial anesthesia. Owing to the patient's condition vigorous artificial respiration had to be resorted to, and the movement thus caused some laceration of the cerebral substance by the exploring-needle. Soon the pulsed ceased to be perceptible, and, as the patient was obviously very near death, the exploring syringe was made to perforate the tentorium cerebelli from above. Immediately an ounce of fetid pus was obtained, the respirstion and pulse recovering at the same instant. The left cere-

bellar fossa was now rapidly trephined and several drachms of pus were evacuated. Progress was henceforth most satisfactory, although there was for many days much word-deafness owing to injury to the temporo-sphenoidal convolutions. The patient was at the present time in better health than before his illness, and was in full practice as a dental surgeon. Speech was nearly perfect; he could now manage a gas and ether extraction, comprising from sixteen to twenty teeth and stumps and could walk ten miles, in spite of his lameness. Mr. Waterhouse alluded to the extreme difficulty that had existed with regard to the decision as to which lateral sinus was affected and the hesitation he felt in risking operating upon the wrong side. He considered that the endocarditis having developed whilst the patient was under observation, and the presence of streptococci in the blood, proved it to be of pyogenic origin. He regretted that he had not at once, in the second operation, trephined for cerebellar abscess, but gave cogent reasons for acting as he had done. Remarks were also made as to the difficulty in locating intracranial abcesses, and another case was related in which Mr. Waterhouse had first explored the cerebellum for an abcess which was situated in the temporo-sphenoidal lobe. This case, fortunately, also recovered. StClair Thomson.

Mastoiditis Following Primary Tubercular Otitis Media—N. Senn—*St. Paul Med. Journal*, June, 1901.

Case of a little boy operated on for tubercular mastoiditis, secondary to a primary otitis media tubercular.

The author is of the opinion that the facial nerve is frequently injured in such operations, "an accident invariably followed by permanent facial paralysis."

The mastoid cavity was vigorously scraped with a sharp spoon, and the cavity then filled with a ten per cent iodoform glycerine emulsion and packed with gauze. Stein.

Membranous Croup—L. T. Poms—*Alkaloidal Clinic.*

Report of two cases in which Vapo-Cresoline inhalations apparently relieved almost moribund patients. F. C. E.

Further Observations on the Clinical Application of the Suprarenal Capsule—W. H. Bates (New York)—*Hot Springs Medical Journal*, April, 1901.

The author's statement that no hemorrhage is so severe from the nose which cannot be completely controlled by the suprarenal extract, and that the hemorrhage in "bleeders" is controlled, is evidently based on insufficient clinical observation. The reporter has seen many cases of nasal hemorrhage, especially of the active form, which did not yield to the use of suprarenal extract, and he has found it practically useless for controlling hemorrhage in "bleeders." Dr. Bates' method of treating "deafness" by "syringing the extract through the punctum of the lower lid down the nasal duct and allowing it to flow over the orifice of the Eustachian tube," gives the extract credit for gymnastic proclivities not often seen in rhino-otologic practice. W. Scheppegrell.

The Treatment of Diphtheria Other than with Antitoxin—J. P. CROZIER GRIFFITH (Philadelphia).—*St. Louis Med. and Surg. Journ.*, June, 1901.

The author believes it an error to put sole dependence on any one line of treatment and invites consideration of some of the hygienic and medicinal methods upon which we can depend as an aid to diphtheria antitoxin.

Under the head of prohylaxis, he remarks that it is a matter of repeated observation that the germs of the disease can often be found in the throat of a healthy nurse caring for a case of diphtheria.

For their own safety the most careful supervision must be kept over both the throats and noses of all members of the family, and the throats of those unavoidably exposed frequently gargled with antiseptic solutions.

As in many cases the disease begins in, or is confined to, the nose, this region should receive treatment in every case. The solutions may be applied by atomizer, though the syringe is more thorough. The solutions used should be those which check bacterial growth, or act as cleansers only, rather than those distinctly bactericidal, the latter being too powerful to be well borne.

In pharyngeal diphtheria solutions may be applied to the pharynx by the syringe, a swab or a brush. The author favors for this purpose a solution of hydrogen peroxide in full strength or slightly diluted, and immediately follows it with Löffler's solution on a swab and held upon the affected parts for a few seconds.

In laryngeal diphtheria the local treatment must be largely by inhalation, and the most useful remedy is steam. It is very important that *enough* vapor be generated. Either the room must be kept full of vapor by plunging red-hot iron, hot bricks, etc., into tubs shallow water, or the child must be surrounded by a croup tent and the air within it kept moist by a steam atomizer or a croup kettle. Home-made croup tents can be made by tying a broomstick upright to each corner of the crib, connecting the tops by cord and throwing blankets over the framework thus made.

The author believes that large doses of alcohol are frequently needed, and are well borne. EATON.

BOOK REVIEWS.

Purulent Nasal Discharges: Their Diagnosis and Treatment. By HERBERT TILLEY, M.D., B.S. Lond., F.R.C.S. Eng., Surgeon to the Throat Hospital, Golden square; Lecturer on Diseases of the Nose and Throat, London Post-Graduate College and Polyclinic. Pages viii to 123, octavo, cloth, price, four shillings net. Publishers, H. K. Lewis, 136 Gower street, London, 1901.

In this carefully prepared and revised monograph the author presents a concise and practical account of suppuration of the nasal accessory cavities, with detailed consideration of the symptoms, diagnosis and treatment of these conditions.

This monograph is eminently practical and includes the most recent surgery and therapeutics of the accessory sinuses. A valuable feature of the volume is the author's account of his own practical experiences in the treatment of this class of cases.

The Diseases of the Respiratory Organs, Acute and Chronic. By WILLIAM F. WAUGH, A.M., M.D., Professor of Practice and Clinical Medicine, Illinois Medical College, etc. Pages 221. Price $1.00 net. G. P. Engelhard & Company, Chicago, 1901.

The author herein advocates methods of treatment based upon the conception of the role played in acute inflammation of the vaso-motor nerves, and his belief that the future of scientific therapeutics lies in the study of pathologic conditions, and the influence of drugs upon them, rather than in the consideration of these maladies as pathologic entities.

Preference to alkaloidal medication, of which the author is an enthusiastic advocate, is given throughout the work. Several of the acute affections, hay-fever, acute laryngitis and acute coryza, are given but brief consideration, but the gist of the subject is retained. The question of laryngeal and pulmonary tuberculosis in their acute and chronic forms, is well though briefly considered. In all, this volume presents to the reader a very good idea of the value of alkaloidal therapy.

Histoire des Maladies du Pharynx (History of Diseases of the Pharynx) Part 1—Graeco-Roman, Byzantine and Arabian period. By Dr. C. CHAUVEAU, Paris. Preface by Dr. du Castel, member de l'Acadamie de Medicine, Paris. Pages, 300; octavo, broch. Publishers: J. Balliere et Fils, 19 Rue Hautefeuille, Paris, 1901.

In a recent issue of THE LARYNGOSCOPE we had the pleasure of reviewing the first of a series of works on the pharynx by this author. This volume of 400 pages treated entirely of the anatomy and physiology of the pharynx and is perhaps the most extensive work on this subject extant.

The present volume, "Histoire des Maladies du Pharynx," is devoted entirely to a consideration of the Graeco-Roman, Byzantine and Arabian periods and forms but the first section of this classic treatise of the pharynx.

As a work of reference to all writers in our special field of medicine this great work of Chauveau should be of much interest and value. M. A. G.

Syphilis; Its Diagnosis and Treatment. By WILLIAM S. GOTTHEIL, M.D., Professor of Dermatology and Syphilogy, New York School of Clinical Medicine; Dermatologist to the Lebanon and Beth-Israel Hospitals, the West-Side German Dispensary, etc. Profusely Illustrated. Pages 216. Price $1.00 net. G. P. Engelhard & Company, Chicago. 1901.

The universal distribution and prevalence of syphilis and its intimate relations and effects on every special subdivision of medicine, renders this subject of immediate and practical interest to the general practitioner and specialist alike.

This volume of 224 pages contains a concise résumé of the most recent research regarding the natural history of this disease and the best methods of combating its manifestations. The volume contains in greater part the personal views and experiences of the author. M. A. G.

Atlas der Krankheiten der Nase, ihrer Nebenhoehlen und des Nasenrachenraumes. By DR. P. H. GERBER, of Könisberg. Issued in 6–7 parts, each containing 5–6 lithographic plates, with descriptive text. Price per part, 6 marks ($1.50). Published by S. Karger, Karlstrasse 15, Berlin, Germany, 1901. American agents, Lemcke & Buechner, 812 Broadway, New York.

Four of the six parts of this atlas have now appeared. The first contains anomalies, septum deviations, atresia and synechia and diseases of the septum.

The second considers atrophic and hypertrophic rhinitis in its various forms.

Part three pictures adenoid vegetations in its various forms, and the varieties of nasal and post-nasal polypi.

In part four are found the various neoplasms of the nasal passages, fibroma, osteoma, sarcoma, carcinoma, cysts, lipoma, rhinoliths and foreign bodies.

We have expressed our favorable comments in a previous review of the clear, lithographic reproductions and good coloring of these plates.

M. A. G.

Atlas der Nasenkrankheiten. (Atlas of Diseases of the Nose). By Hofrath Dr. Robert Krieg, of Stuttgart, Germany; 38 Chromo-Lithographic Plates, 475 Figures, with descriptive text in German and English. Complete in (7) seven parts, each part containing (6) six plates. Price, 42 marks ($10.50). Publisher, Ferdinand Enke. American agents, Lemcke & Buechner, 812 Broadway, N. Y.

The Krieg Atlas, complete in seven parts, presents the clinical pictures observed in nasal and post-nasal pathology in a most extensive manner by excellent plates and concise descriptive text. This atlas has the additional advantage of presenting simultaneously the German and English texts explanatory of each plate, and as such it is especially commendable to our American and English readers. M. A. G.

Progressive Medicine, Vol. II, June, 1901. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by Hobart Amory Hare, M.D., Professor of Therapeutics and Materia Medica in Jefferson Medical College of Philadelphia. Octavo, handsomely bound in cloth, 470 pages, with 81 engravings and one full-page plate. Lea Brothers & Co., Philadelphia and New York. Issued quarterly. Price, $10.00 per year.

The present volume of this series contains but little matter directly referable to laryngology or otology, yet the important chapters on blood, diabetes mellitus, and hemophelia present many valuable suggestions.

The chapters on surgery of the abdomen and gynecology form the bulk of the volume. The concluding chapter on ophthalmology, by Edward Jackson, may be of much interest to many of our readers.